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VOL IV-D

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INTERACTIONAL AERODYNAMICS OF THE SINGLE  
ROTOR HELICOPTER CONFIGURATION

VOLUME IV-E - One-Third Octave Band Spectrograms  
of Wake Split Film Data, Air Ejectors

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APPLIED TECHNOLOGY LABORATORY

U. S. ARMY RESEARCH AND TECHNOLOGY LABORATORIES (AVRADCOM)

Fort Eustis, Va. 23604

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## APPLIED TECHNOLOGY LABORATORY POSITION STATEMENT

In 1975 a wind tunnel test program was conducted in the Boeing-Vertol 20-foot V/STOL Wind Tunnel on a 1/5th-scale UTTAS model to investigate and find solutions for several aerodynamic problems encountered during the UTTAS flight-testing. Specifically, these tests focused upon (a) the structure of the hub/rotor wake in the vicinity of the empennage, (b) the formulation of the ground vortex and its relation to hub loads and fuselage loads during transition, and (c) the occurrence of vibratory air pressures from the blade passing over the fuselage. Only portions of the above-mentioned wind tunnel test data were reduced and analyzed in addressing the flight-test problems of the UTTAS aircraft.

Under Contract DAAJ02-77-C-0020, Boeing-Vertol completed analyses on the data to understand more completely the aerodynamic interactions that are involved and to formulate instructions for the guidance of designers in these respects. The results of these studies are applicable to all existing and future single-rotor/tail rotor helicopters. The data have been segregated according to aerodynamic interactions and associated phenomena/problem areas. From this body of knowledge, a generalized set of design guidelines meaningful to the single-rotor helicopter design concept formulation were developed and are included in these reports.

Mr. Robert P. Smith of the Aeronautical Technology Division, Aeromechanics Technical Area, served as project engineer for this effort.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This is the fifth of the seven sub-volumes of Volume IV containing one-third octave band spectrographs of the model helicopter hub/rotor wake as it was modified by various aerodynamic devices. This sub-volume deals with the effects of various air ejector systems on the wake.		

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## PREFACE

The entire report describing the investigation of INTERACTIONAL AERODYNAMICS OF THE SINGLE-ROTOR HELICOPTER CONFIGURATION comprises eight numbered volumes bound as 33 separate documents. The complete list of these documents is as follows:

### Volume I, Final Report

### Volume II, Harmonic Analyses of Airframe Surface Pressure Data

- A — Runs 7-14, Forward Section
- B — Runs 7-14, Mid Section
- C — Runs 7-14, Aft Section
- D — Runs 15-22, Forward Section
- E — Runs 15-22, Mid Section
- F — Runs 15-22, Aft Section
- G — Runs 23-33, Forward Section
- H — Runs 23-33, Mid Section
- I — Runs 23-33, Aft Section

### Volume III, Flow Angle and Velocity Wake Profiles in Low-Frequency Band

- A — Basic Investigations and Hubcap Variations
- B — Air Ejector Systems and Other Devices

### Volume IV, One-Third Octave Band Spectrograms of Wake Split-Film Data

- A — Buildup to Baseline
- B — Basic Configuration Wake Explorations
- C — Solid Hubcaps
- D — Open Hubcaps
- E — Air Ejectors
- F — Air Ejectors With Hubcaps; Wings
- G — Fairings and Surface Devices

This volume is

### Volume V, Harmonic Analyses of Hub Wake

### Volume VI, One-Third Octave Band Spectrograms of Wake Single Film Data

- A — Buildup to Baseline
- B — Basic Configuration Wake Exploration
- C — Hubcaps and Air Ejectors

### Volume VII, Frequency Analyses of Wake Split-Film Data

- A — Buildup to Baseline
- B — Basic Configuration Wake Explorations
- C — Solid Hubcaps

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- D - Open Hubcaps
- E - Air Ejectors
- F - Air Ejectors With Hubcaps; Wings
- G - Fairings and Surface Devices

**Volume VIII, Frequency Analyses of Wake Single Film Data**

- A - Buildup to Baseline
- B - Basic Configuration Wake Exploration
- C - Hubcaps and Air Ejectors

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## INTRODUCTION

Volume IV presents spectrograms of the flow angles and velocity components for each run and its test points. Specifically, these machine plots show the root mean square value of each wake parameter over discrete frequency intervals one-third of an octave band in width. The octave arrangement is selected to provide 19 spectral increments from 3.9 to 250.0 Hz centerband frequency. A special computer program is employed to derive wake parameters within these bands consistent with corresponding basic spectral functions depicted in Volume VII.

The graphs showing the one-third octave band values are sequenced in the same order as the Outline of Wake Investigations (Table 1). These graphs are distributed among Volumes IV-A through IV-G by the major categories of Table I in the following arrangement:

Volume IV-A	Build-up to Baseline
Volume IV-B	Basic Configuration
Volume IV-C	Effect of Hub Caps Section 1 & 2
Volume IV-D	Effect of Hub Caps Section 3 & 4
Volume IV-E	Effect of Hub Caps Section 5 and Effect of Air Ejectors
Volume IV-F	Air Ejectors with Open Hub Caps and Effect of Wings and Misc. Section
Volume IV-G	Effect of Wings and Misc. Sections 2 and 3

The Table I outline and other material is included for reference and as a context to the work of each sub-volume. Table 2, the List of Test Runs, arranges the runs in numerical order and gives pertinent text parameters.

The Index of Rake Positions, Table 3, lists the hot film transducer rake positions in the model coordinate system for each run and its test points. The main feature of Table 3 is the indexing of the test point number to the model waterline station and butt line as it varied from run to run. The table groups the runs as they shared the indexing correspondence of point with position. It is emphasized that the runs in a group do not necessarily all share the same number of test points but they do have same correspondence within their respective ranges of test points.

The orientation of the rake is shown pictorially in Figures 1 through 6 for the various test runs. Figure 7 presents a scaled drawing of the model with reference to the three-axis coordinate system. Table 4 lists the center frequency and the upper and lower band limits for each of the numbered one-third octave bands.

TABLE 1			
OUTLINE OF WAKE INVESTIGATIONS			
Description	Configuration Code	Run No.	Base-line
<u>Build-up to Baseline</u>			
1. Nacelles removed	$K_{13}+H_{1-N}$	149	150
2. Blades off, rotating hub	$K_{13}-M+H_{1.0}$	160	156
3. " " , non-rotating hub	$K_{13}-M+H_{1.0}$	158	156
4. " " , hub off	$K_{13}-M-H_{1.0}$	159	156
<u>Basic Configuration</u>			
1. <u>Wake Explorations near Empennage</u>			
(a) 15" Long. + traverse at T/R C.L.	$K_{11}$	111	---
(b) 9" Vert. + " above T/R "	"	112	---
(c) 2" " " in vortex	"	113	---
(d) 8" " " (continue 112)	"	114	---
(e) 13" " " behind stab.	"	115	---
(f) Lateral traverse, left stab. (One T.P. only)	"	116	---
(g) Same continued	"	117	---
(h) Same continued (One T.P. only)	"	118	---
(i) Lateral traverse right stab.	"	119	---
(j) T/R effect on wake	$K_{11}+T_2^0$	121	115
2. <u>Climb/Descent Studies</u>			
(a) Climb 900 FPM	$K_{11}$	135	---
(b) Descent 800 FPM	"	136	---
<u>Effect Of Hub Caps</u>			
1. <u>Solid Caps on Canister</u>			
(a) 7.6" diam. 2.17" ht. soft Pitch Arms	$K_{11}-H_{1.0}+H_{1.2}$	137	136
(b) 7.6" diam. 2.17" ht. stiff Pitch Arms	$K_{13}+H_{1.2}$	153	156
(b) 7.6" diam. 2.45" ht. flt. test config.	$K_{13}+H_{1.2.1}+I_1$ $+E_{1.0}$	207	188

TABLE 1 (CONTINUED)

## OUTLINE OF WAKE INVESTIGATIONS

Description	Configuration Code*	Run No.	Base-line
<u>Effect of Hub Caps (Continued)</u>			
2. <u>Solid Caps Raised Above Canister</u>			
(a) 7.6" diam. 2.45" ht. 70" depth, .55 gap	$H_{1.2.2} + I_1 + E_{1.0}$	208	188
(b) 10.0" diam. 3.25" ht. 1.55" depth, .50" gap	$H_{1.8.1} + I_1 + E_{1.0}$	189	188
(c) 10.0" diam. 4.125" ht. 2.05" depth, .875" gap	$H_{1.8.2} + I_1 + E_{1.0}$	190	188
(d) Repeat of 189	" " "	210	188
3. <u>Open Caps Without Underbody</u>			
(a) 10.0" diam. 1.25" gap, blades	$H_{1.0.2} + I_1 + E_{1.0}$	193	188/166
(b) " " " gap, no blades	$H_{1.0.1} - M$	166	158
(c) " " 2.05" gap, blades	$H_{1.14.1} + I_1 + E_{1.0}$	211	188
(d) " " 1.75" gap, no blades	$H_{1.0.1} - M$	165	158
(e) " " 1.87" gap, blades	$H_{1.0.3} + I_1 + E_{1.0}$	191	188
(f) 16" diam. 2.00" gap, blades	$H_{1.7.1}$	168	156/167
(g) " " " gap, no blades	$H_{1.7.1} - M$	167	158
(h) " " 4.00" gap, blades	$H_{1.7.2}$	169	156
4. <u>Open Caps with Underbody</u>			
(a) 7.6" diam. 1.25" gap	$H_{1.11.1} + I_2 + E_{1.0}$	194	188
(b) " " " " "	$H_{1.11.1} + I_2 + E_{4.0}$	198	188
(c) " " " " center post	$H_{1.11.2} + I_2$	202	194
(d) 10.0" diam. .5" gap, no blades	$H_{1.5.1} - M$	164	158
(e) " " 1.25" gap, no blades	$H_{1.5.2} - M$	161	158
(f) " " 2.0" gap, no blades	$H_{1.5.4} - M$	163	158
(g) " " 4.0" gap, no blades	$H_{1.5.3} - M$	162	158
(h) " " 1.25" gap	$H_{1.5.2}$	154	156/161
*Basic Code is K13.			

TABLE 1 (CONTINUED)			
OUTLINE OF WAKE INVESTIGATIONS			
Description	Configuration Code*	Run No.	Base-line
<u>5. Miscellaneous Hub Covers</u>			
(a) Hub fairing 16" diam.	H <sub>1.3</sub>	151	150
(b) Wham-O-Frisbee 10" diam.	H <sub>1.9.0</sub> +E <sub>1.2</sub>	182	181
(c) Fab. glass Frisbee 16" diam.	H <sub>1.9.1</sub> +E <sub>1.2</sub>	183	181
<u>Effect of Air Ejectors</u>			
1. Basic system no blowing	H <sub>1.0</sub> +E <sub>1.0</sub>	172	156
2. " " 40 psi	" "	173	156/172
3. " " 150 psi	" "	174	156/172
4. Wide chord shroud 40 psi	H <sub>1.0</sub> +E <sub>2.5.1</sub>	175	156/173
5. Wide " " 150 psi	" "	176	156/174
6. W/C shroud w. lip 40 psi	H <sub>1.0</sub> +E <sub>3.5.2</sub>	184	156/173
7. Same Contoured Parallel 150 psi	H <sub>1.0</sub> +E <sub>3.5.4</sub>	187	156/174
8. Bifurcated duct 0 psi	H <sub>1.0</sub> +E <sub>5.0</sub>	203	156
9. " " 40 psi	" "	204	156/203
10. " " 150 psi	" "	205	156/203
<u>Air Ejectors with Open Hub Caps with Underbodies</u>			
1. 7.6" diam. 1.25" gap, 0 psi	H <sub>1.11.1</sub> +I <sub>2</sub> +E <sub>1.0</sub>	194	188/172
2. " " " " 20 psi	" " " "	195	188
3. " " " " 40 psi	" " " "	196	188/173
4. " " " " 150 psi	" " " "	197	188/174
5. " " " " 0 psi	H <sub>1.11.1</sub> +I <sub>2</sub> +E <sub>4.0</sub>	198	188/194
6. " " " " 40 psi	" " " "	199	188/196
7. " " " " 150 psi	" " " "	200	188/196
8. Same with center post	H <sub>1.11.2</sub> +I <sub>2</sub> +E <sub>4.6</sub>	201	188/200
9. 10.0" diam. 2.0" gap wide ch'd. shroud (150 psi)	H <sub>1.5.4</sub> +E <sub>2.5.1</sub>	177	156/176
<u>Effect of Wings and Misc.</u>			
1. Wings			
(a) Nacelle-mounted stub wing	H <sub>1.0</sub> +W <sub>1.0</sub> +E <sub>1.1</sub>	178	181
(b) Single slotted flapped wing	H <sub>1.0</sub> +W <sub>3.0</sub> +E <sub>1.0</sub>	180	181
(c) Double slotted flapped wing	H <sub>1.0</sub> +W <sub>2.0</sub> +E <sub>1.0</sub>	179	181
(d) Boom-mounted stub wing	H <sub>1.0</sub> +W <sub>4.0</sub>	186	156
*Basic Code is K13.			



TABLE 1 (CONTINUED)

## OUTLINE OF WAKE INVESTIGATIONS

Description	Configuration Code*	Run No.	Base-line
2. Crown Fairings			
(a) Flat top behind shaft	$K_{11}+D_1$	140	138
(b) Round top behind shaft	$K_{11}+D_2$	141	138
(c) Extended flat top fairing	$H_1+D_4$	170	156
(d) Flat top + 16" cap, 4" gap	$H_{1.7.2}+D_4$	171	170
(e) Forward fairing/nacelle fairing	$P_{1.0}$	152	156
3. Surface Devices			
(a) Vortex generators	$K_{11}+VG_{2.1}$	139	138
(b) Guidevane between nacelles	$K_{11}+FV_1$	142	138
(c) Longitudinal strakes	$H_{1.5.3}+S_4$	155	156
(d) 14% porosity spoiler	$K_{11}+X_1$	143	138
*Basic Code is K13 unless noted otherwise.			



TABLE 2  
LIST OF TEST RUNS  
BASIC INVESTIGATIONS OF THE HUB WAKE

RUN NO.	CONFIGURATION/CONDITION	VTUN KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT. h/d	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
111	K <sub>11</sub> /15" Long. wake traverse at TR center line	80	1433/0	8	6.0	-2.0	$\infty$	Off
112	" /9" Vert. wake traverse above TR center line	"	"	"	"	"	"	"
113	" /2" Vert traverse through MR vortex	"	"	"	"	"	"	"
114	" /8" Vert. traverse below TR center line	"	"	"	"	"	"	"
115	" /13" Vert. traverse behind stabilizer	"	"	"	"	"	"	"
116	" /Lateral traverse - left stabilizer	"	"	"	"	"	"	"
117	" /116 continued	"	"	"	"	"	"	"
118	" /116 continued	"	"	"	"	"	"	"
119	" /Lateral traverse - right stabilizer	"	"	"	"	"	"	"
121	K <sub>11</sub> +T <sub>2</sub> /Effect of tail rotor flow on wake	"	1433/4500	"	"	"	"	On
135	K <sub>11</sub> /Wake in 900 fpm climb	"	"	"	-6.0	-4.5	"	Off
136	" /Wake in 800 fpm descent	"	"	"	6.0	-2.0	"	"

TABLE 2 (CONTINUED)  
LIST OF TEST RUNS  
EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	VTUN KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT. h/d	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
137	$K_{11}-H_{1.0}+H_{1.2}$ /Effect of 7.6 inch diam. solid hub cap	80	1433/0	8	0	-3.8	$\infty$	Off
138	$K_{11}$ /Repeat of base run	"	"	"	"	"	"	"
139	$K_{11}+VG_{2.1}$ /Effect of vortex generators on aft crown	"	"	"	"	"	"	"
140	$K_{11}+D_1$ /Flat-topped "doghouse" fairing on aft crown	"	"	"	"	"	"	"
141	$K_{11}+D_2$ /Rounded-top fairing	"	"	"	"	"	"	"
142	$K_{11}+FV_1$ /Deflection vane on crown between nacelles	"	"	"	"	"	"	"
143	$K_{11}+X_1$ /Variable porosity spoiler	"	"	"	"	"	"	"
149	$K_{13}+H_1-N_1$ /Effect of nacelles off also add stiff pitch arms ( $K_{13}$ )	60	1075/0	4.5	"	"	"	"
150	$K_{13}+H_1$ /60 knot baseline	"	"	"	"	"	"	"
151	$K_{13}+H_{1.3}/16$ inch diam. helmet fairing	"	"	"	"	"	"	"
152	$K_{13}+P_{1.0}$ /Pylon and intake fairings	80	1433/0	8	"	"	"	"
153	$K_{13}+H_{1.2}$ /Repeat 137 with $K_{13}$ pitch arms	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)

## LIST OF TEST RUNS

## EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V <sub>TUN</sub> KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT. h/d	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
154	K <sub>13</sub> +H <sub>1.5.2/10</sub> " open hub cap, 7" underbody, 1.25" gap	80	1433/0	8	6	-3.8	$\infty$	Off
155	K <sub>13</sub> +H <sub>1.5.2+S<sub>4</sub></sub> /Same as 154 except strakes on aft crown	"	"	"	"	"	"	"
156	K <sub>13</sub> +H <sub>1.0</sub> /Baseline with K <sub>13</sub> , i.e., stiff pitch arms	"	"	"	"	"	"	"
158	K <sub>13</sub> -M+H <sub>1.0</sub> /Wake studies with blades off, hub not rotating	"	0/0	"	"	"	"	"
159	K <sub>13</sub> -M-H <sub>1.0</sub> /Wake studies with hub off	"	"	"	"	"	"	"
160	K <sub>13</sub> -M+H <sub>1.0</sub> /Same as 158 except hub is rotating	"	1433/0	"	"	"	"	"
161	K <sub>13</sub> -M+H <sub>1.5.2</sub> /Repeat of 154 without blades	"	0/0	"	"	"	"	"
162	K <sub>13</sub> -M+H <sub>1.5.3</sub> /Same as 161 except 4" gap	"	"	"	"	"	"	"
163	K <sub>13</sub> -M+H <sub>1.5.4</sub> /Same as 161 except 2" gap	"	"	"	"	"	"	"
164	K <sub>13</sub> -M+H <sub>1.5.1</sub> /Same as 161 except 0.5" gap	"	"	"	"	"	"	"
165	K <sub>13</sub> -M+H <sub>1.0.1/10</sub> " open hub cap, no underbody, same cap vert. position as Run 154	"	"	"	"	"	"	"
166	K <sub>13</sub> -M+H <sub>1.0.2</sub> /Same as 165 with cap lowered by 0.5"	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)  
LIST OF TEST RUNS  
EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	VTUN KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT. h/d	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
167	K <sub>13</sub> -M+H <sub>1.7.1/16</sub> " open cap, no under- body, 2" gap	80	0/0	8	6	-3.8	$\infty$	Off
168	K <sub>13</sub> +H <sub>1.7.1</sub> /Blades on, same cap config. as 167	"	1433/0	"	"	"	"	"
169	K <sub>13</sub> +H <sub>1.7.2/16</sub> " open cap, no under- body, 4" gap	"	"	"	"	"	"	"
170	K <sub>13</sub> +H <sub>1.0</sub> +D <sub>4.0</sub> /Extended flat top fairing on aft crown	"	"	"	"	"	"	"
171	K <sub>13</sub> +H <sub>1.7.2</sub> +D <sub>4.0</sub> /Same fairing as 170, same cap as 169	"	"	"	"	"	"	"
172	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>1.0</sub> (0psi)/Basic air ejec- tor zero blowing baseline	"	"	"	"	"	"	"
173	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>1.0</sub> (40 psi)/Same as 172 with 40 psi supply	"	"	"	"	"	"	"
174	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>1.0</sub> (150 psi)/Same as 172 with 150 psi supply	"	"	"	"	"	"	"
175	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>2.5.1</sub> (40 psi)/Ejector with wide chord shroud at 40 psi	"	"	"	"	"	"	"
176	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>2.5.1</sub> (150 psi)/Same as 174 with 150 psi supply	"	"	"	"	"	"	"
177	K <sub>13</sub> +H <sub>1.5</sub> +E <sub>2.5.1</sub> (150 psi)/Same as 176 with 10" cap like 163	"	"	"	"	"	"	"
178	K <sub>13</sub> +H <sub>1.0</sub> +W <sub>1.0</sub> +E <sub>1.1</sub> (0 psi)/Nacelle mounted wing	"	"	"	"	"	"	"



TABLE 2 (CONTINUED)  
LIST OF TEST RUNS  
EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	VTUN KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
179	K <sub>13</sub> +H <sub>1.0</sub> +W <sub>2.0</sub> +E <sub>1.0</sub> (0 psi)/Double slotted flapped wing	80	1433/0	8	6	-3.8	$\infty$	Off
180	K <sub>13</sub> +H <sub>1.0</sub> +W <sub>3.0</sub> +E <sub>1.0</sub> (0 psi)/Single slotted flapped wing	"	"	"	"	"	"	"
181	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>1.2</sub> (0 psi)/Baseline with ejector tube moved aft	"	"	"	"	"	"	"
182	K <sub>13</sub> +H <sub>1.9</sub> +E <sub>1.2</sub> (0 psi)/Standard 10" frisbee	"	"	"	"	"	"	"
183	K <sub>13</sub> +H <sub>1.9</sub> +E <sub>1.2</sub> (0 psi)/16" fabricated frisbee	"	"	"	"	"	"	"
184	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>3.5</sub> .2 (40 psi)/Wide chord with lip at 40 psi	"	"	"	"	"	"	"
185	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>3.5</sub> .2 (150 psi)/Same as 184 with 150 psi air	"	"	"	"	"	"	"
186	K <sub>13</sub> +H <sub>1.0</sub> +W <sub>4.0</sub> /Boom mounted stub wing	"	"	"	"	"	"	"
187	K <sub>13</sub> +H <sub>1.0</sub> +E <sub>3.5</sub> .4 (150 psi)/Like 185 with modified shroud	"	"	"	"	"	"	"
188	K <sub>13</sub> +H <sub>1.0</sub> +I <sub>1</sub> +E <sub>1.0</sub> (0 psi)/Baseline with I <sub>1</sub> instr. ring	"	"	"	"	"	"	"
189	K <sub>13</sub> +H <sub>1.8</sub> +I <sub>1</sub> +E <sub>1.0</sub> (0 psi)/Solid cap, 10" diam. 3.25" height	"	"	"	"	"	"	"
190	K <sub>13</sub> +H <sub>1.8</sub> +I <sub>1</sub> +E <sub>1.0</sub> (0 psi)/Same as 190 except + 4.12" height	"	"	"	"	"	"	"



TABLE 2 (CONTINUED)  
LIST OF TEST RUNS  
EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	VTUN KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT. h/d	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
191	K13+H1.0.2+I1+E1.0 (0 psi)/10" cap, no underbody, 1.87" gap	80	1433/0	8	6	-3.8	$\infty$	Off
193	K13+H1.0.2+I1+E1.0 (0 psi)/10" cap, no underbody, 1.25" gap	"	"	"	"	"	"	"
194	K13+H1.11.1+I2+E1.0 (0 psi)/7.6" cap, underbody, 1.25" gap	"	"	"	"	"	"	"
195	K13+H1.11.1+I2+E1.0 (20 psi)/Same as 194 with 20 psi air	"	"	"	"	"	"	"
196	K13+H1.11.1+I2+E1.0 (40 psi)/Same as 194 with 40 psi air	"	"	"	"	"	"	"
197	K13+H1.11.1+I2+E1.0 (150 psi)/Same as 194 with 150 psi air	"	"	"	"	"	"	"
198	K13+H1.11.1+I2+E4.0 (0 psi)/Same as 194 except blowing tube 2" aft	"	"	"	"	"	"	"
199	K13+H1.11.1+I2+E4.0 (40 psi)/Same as 198 with 40 psi air	"	"	"	"	"	"	"
200	K13+H1.11.1+I2+E4.0 (150 psi)/Same as 198 with 150 psi air	"	"	"	"	"	"	"
201	K13+H1.11.2+I2+E4.0 (150 psi)/Same as 200 except center support cap	"	"	"	"	"	"	"
202	K13+H1.11.2+I2/Baseline with I2 and no blowing tube	"	"	"	"	"	"	"
203	K13+H1.0+E5.0 (0 psi)/Bifurcated air duct baseline	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)  
LIST OF TEST RUNS  
EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	VTUN KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT. h/d	TAIL ROTOR
					$\alpha^\circ$	$\psi^\circ$		
204	K13+H1.0+E5.0 (150 psi)/Bifurcated duct with 150 psi air	80	1433/0	8	6	-3.8	$\infty$	Off
205	K13+H1.0+E5.0 (40 psi)/Same as 204 with 40 psi air	"	"	"	"	"	"	"
207	K13+H1.2.1+I1+E1.0 (0 psi)/7.6" solid cap, no gap	"	"	"	"	"	"	"
208	K13+H1.2.2+I1+E1.0 (0 psi)/Same as 207 except 0.55" gap	"	"	"	"	"	"	"
210	K13+H1.15.1+I1+E1.0 (0 psi)/Repeat of 189	"	"	"	"	"	"	"
211	K13+H1.14.1+I1+E1.0 (0 psi)/Like 189 and 210 except cap is open	"	"	"	"	"	"	"

TABLE 3					
INDEX TO RAKE POSITIONS					
RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
111	20	53.5	103.1	-7.25	1
	21	"	"	"	
	22	"	105.0	"	
	24	"	107.0	"	
	26	"	109.0	"	
	28	"	111.0	"	
	30	"	112.9	"	
	32	"	114.9	"	
	34	"	116.9	"	
	36	"	118.9	"	
112	2	48.9	107.3	-7.25	1
	4	50.8	"	"	
	6	52.7	103.3	"	
	8	54.5	"	"	
	10	56.2	"	"	
	12	57.2	"	"	
113	2	51.7	103.3	-3.25	1
	4	52.3	"	"	
	6	52.8	"	"	
	8	53.3	"	"	
	10	53.9	"	"	
	11	53.3	"	"	
114	2	44.5	103.0	-3.25	1
	4	46.4	"	"	
	6	48.2	"	"	
	8	50.0	"	"	
	10	51.9	"	"	
115	3	52.9	124.7	-3.25	1
	4	52.0	"	"	
	6	50.0	"	"	
	9	48.0	"	"	
	10	46.0	"	"	
	12	44.1	"	"	
	14	42.1	"	"	
	16	53.0	"	"	
	18	54.0	"	"	
	20	55.0	"	"	

TABLE 3 (CONTINUED)					
INDEX TO RAKE POSITIONS					
RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
116	7	36.9	100.5	-17.5	1
117	2	37.6	100.5	-16.0	1
	4	"	"	-14.0	
	6	37.3	99.6	-12.0	
	8	"	"	-10.0	
	10	"	"	- 8.0	
118	2	37.6	100.5	- 6.0	1
119	2	37.3	99.6	+ 6.0	1
	5	"	"	8	
	8	"	"	10	
	9	"	"	"	
	14	"	"	14	
	16	"	"	16	
	20	51.5	102.5	17.5	
121	25	52.3	101.7	-17.5	2
	3	62.9	129.0	+ 5.7	
	4	53.5	"	"	
	6	50.1	"	"	
	8	46.0	"	"	
135	10	42.1	"	"	3
	2	56.9	106.3	- 5.7	
	4	54.5	"	"	
	6	52.5	"	"	
	8	50.5	"	"	
	10	48.5	"	"	
	12	46.5	"	"	
136	14	44.5	"	"	4
	2	56.5	104.0	- 8.0	
	4	54.5	"	"	
	6	52.5	"	"	
	8	50.6	"	"	
	10	48.5	"	"	
	12	46.5	"	"	
	14	44.5	"	"	
	17	37.1	"	"	
	18	39.0	"	"	
	19	41.0	"	"	

79 01 22 056

TABLE 3 (CONTINUED)  
INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
137	3	38.7	98.4	- 8.0	5
	5	39.9	"	"	
	7	42.0	100.5	"	
	9	44.0	"	"	
	11	46.0	103.6	"	
	13	48.0	"	"	
	15	50.0	"	"	
	17	52.0	"	"	
	19	54.0	"	"	
138-41, 143	2	38.8	98.4	- 8.0	5
	3	40.0	"	"	
	4	42.0	100.5	"	
	5	44.0	"	"	
	6	46.0	103.6	"	
	7	48.0	"	"	
	8	50.0	"	"	
	9	52.0	"	"	
	10	54.0	"	"	
142	7	37.8	98.4	- 8.0	5
	8	"	"	"	
	9	40.2	"	"	
	10	42.0	100.5	"	
	11	44.0	"	"	
	12	46.0	103.6	"	
	13	48.0	"	"	
	14	50.0	"	"	
	15	52.0	"	"	
	16	54.0	"	"	
	17	56.8	"	"	



TABLE 3 (CONTINUED)  
INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
149-151	2	38.8	98.5	- 8.0	5
	3	40.0	"	"	
	4	42.0	100.6	"	
	5	44.0	"	"	
	6	46.0	103.5	"	
	7	48.0	"	"	
	8	50.0	"	"	
	9	52.0	"	"	
	10	54.0	"	"	
152-6, 158 161-4, 166 167, 169-71 175, 177-9 180, 182, 184 186-8, 190 191, 193, 194 196, 198, 201 204, 207, 208 211	2	42.9	97.9	0.0	6
	3	44.9	"	"	
	4	46.9	100.6	"	
	5	48.9	"	"	
	6	50.9	104.6	"	
	7	52.9	"	"	
	8	54.9	"	"	
	9	56.9	"	"	
159	1	54.9	104.6	0.0	6
	2	52.9	"	"	
	3	50.7	"	"	
	4	48.6	100.6	"	
	5	46.7	"	"	
160, 203	5	42.9	97.9	0.0	6
	6	44.9	"	"	
	7	46.9	100.6	"	
	8	48.9	"	"	
	9	50.9	104.6	"	
	10	52.9	"	"	
	11	54.9	"	"	
165	3	44.9	97.9	0.0	6
	4	42.9	"	"	
	5	46.9	100.6	"	
	6	48.9	"	"	
	7	50.9	104.6	"	
	8	52.9	"	"	

TABLE 3 (CONTINUED)  
INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
168, 183	4	42.9	97.9	0.0	6
	5	44.9	"	"	
	6	46.9	100.6	"	
	7	48.9	"	"	
	8	50.9	104.6	"	
	9	52.9	"	"	
	10	54.9	"	"	
172	3	42.9	97.9	0.0	6
	4	44.9	"	"	
	6	44.9	"	"	
	7	46.9	100.6	"	
	8	48.9	"	"	
	9	50.9	104.6	"	
	10	52.9	"	"	
173,174,176 185,195,197 199,200,205 210	1	42.9	97.9	0.0	6
	2	44.9	"	"	
	3	46.9	100.6	"	
	4	48.9	"	"	
	5	50.9	104.6	"	
	6	52.9	"	"	
	7	54.9	"	"	
181	2	42.9	97.9	0.0	6
	3	44.9	"	"	
	4	46.9	100.6	"	
	5	48.9	"	"	
	6	50.9	104.6	"	
	7	52.9	"	"	
	9	54.9	"	"	
	10	"	"	"	
	11	"	"	"	
	12	"	"	"	
	13	42.9	97.9	"	

TABLE 3 (CONTINUED)

INDEX TO RAKE POSITIONS

[illegible]



RUN 121

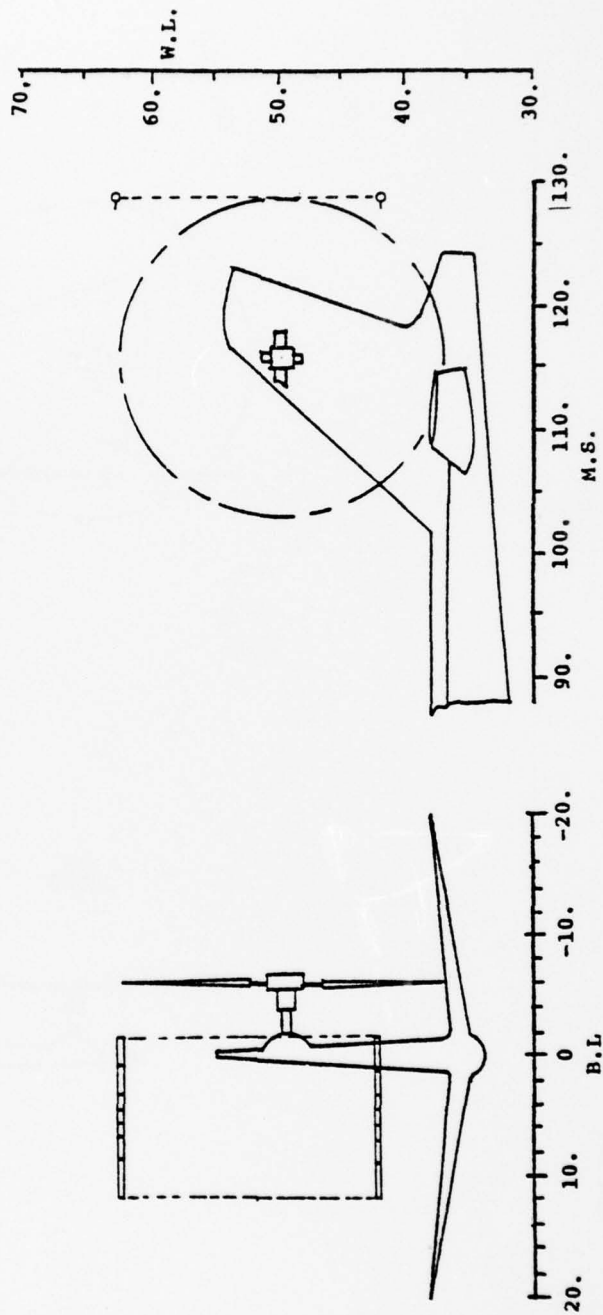


FIGURE 2 -HOT FILM RAKE LOCATIONS



RUN 135

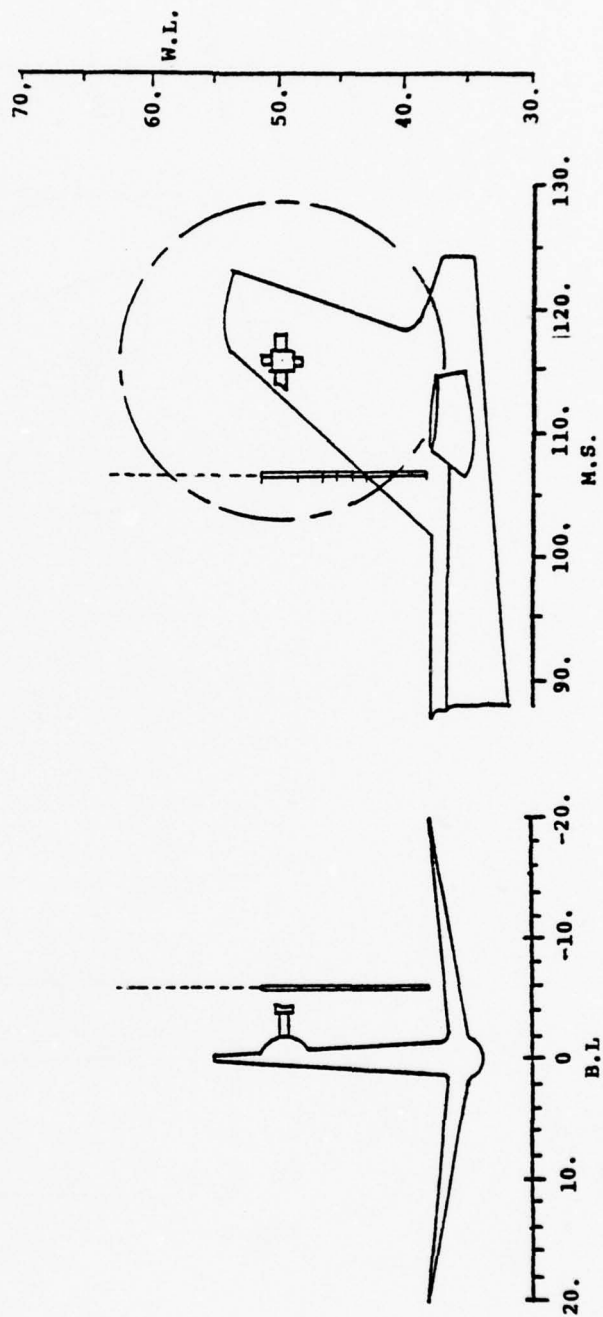


FIGURE 3 -HOT FILM RAKE LOCATIONS

RUN 136

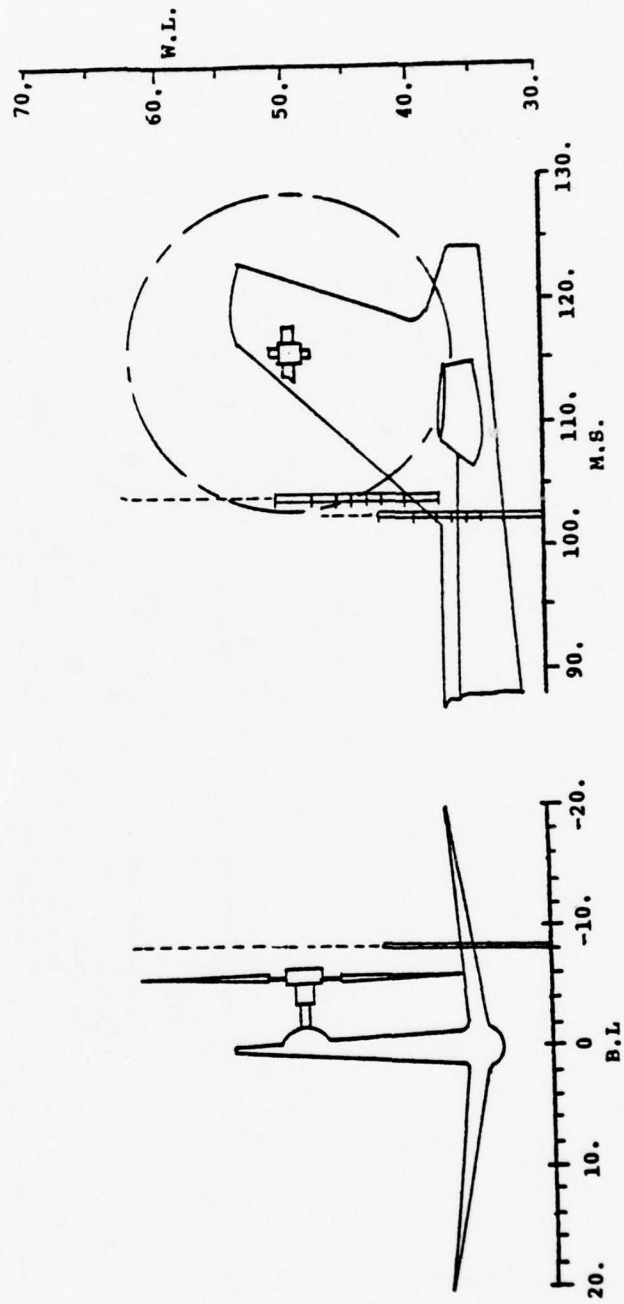


FIGURE 4 -HOT FILM RAKE LOCATIONS

RUN 137, 138, 139, 140, 141, 142,  
143, 148, 149, 150, 151

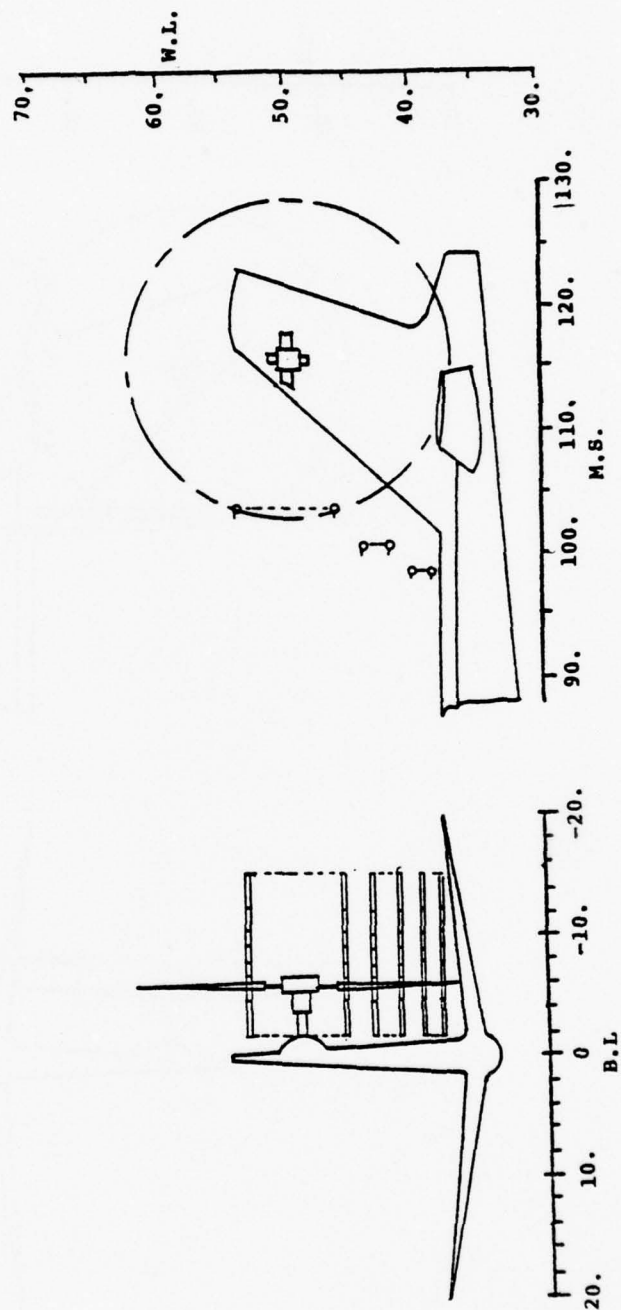


FIGURE 5 -HOT FILM RAKE LOCATIONS

RUN 152-156, 158-211

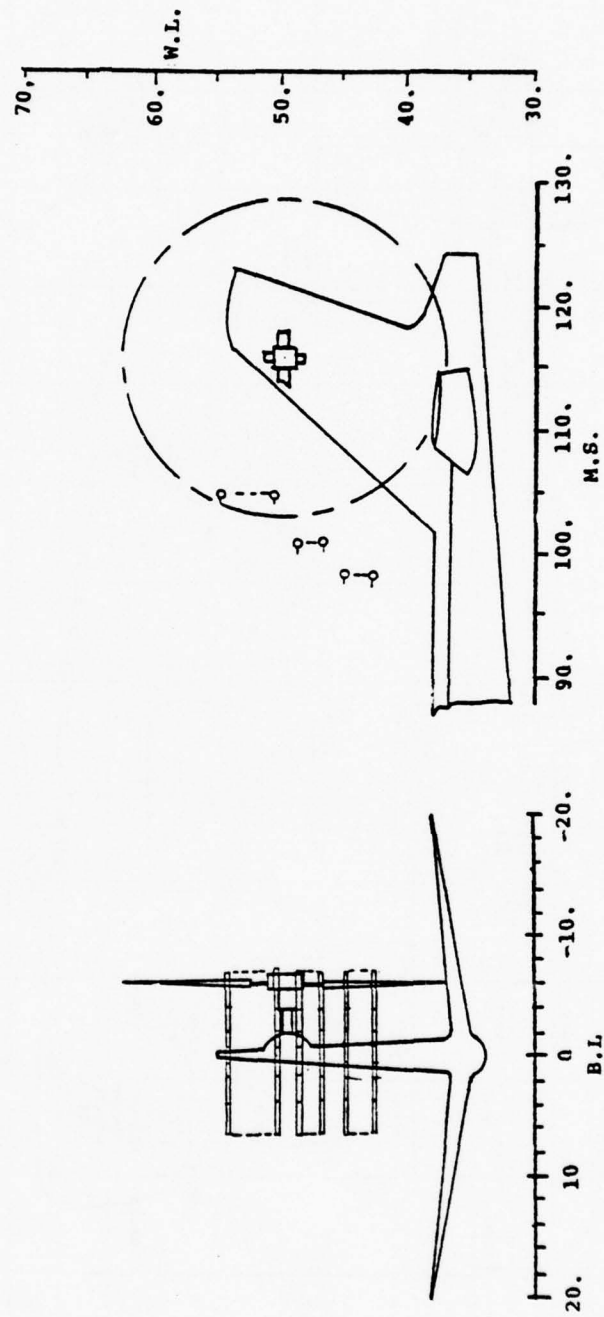


FIGURE 6 -HOT FILM RAKE LOCATIONS



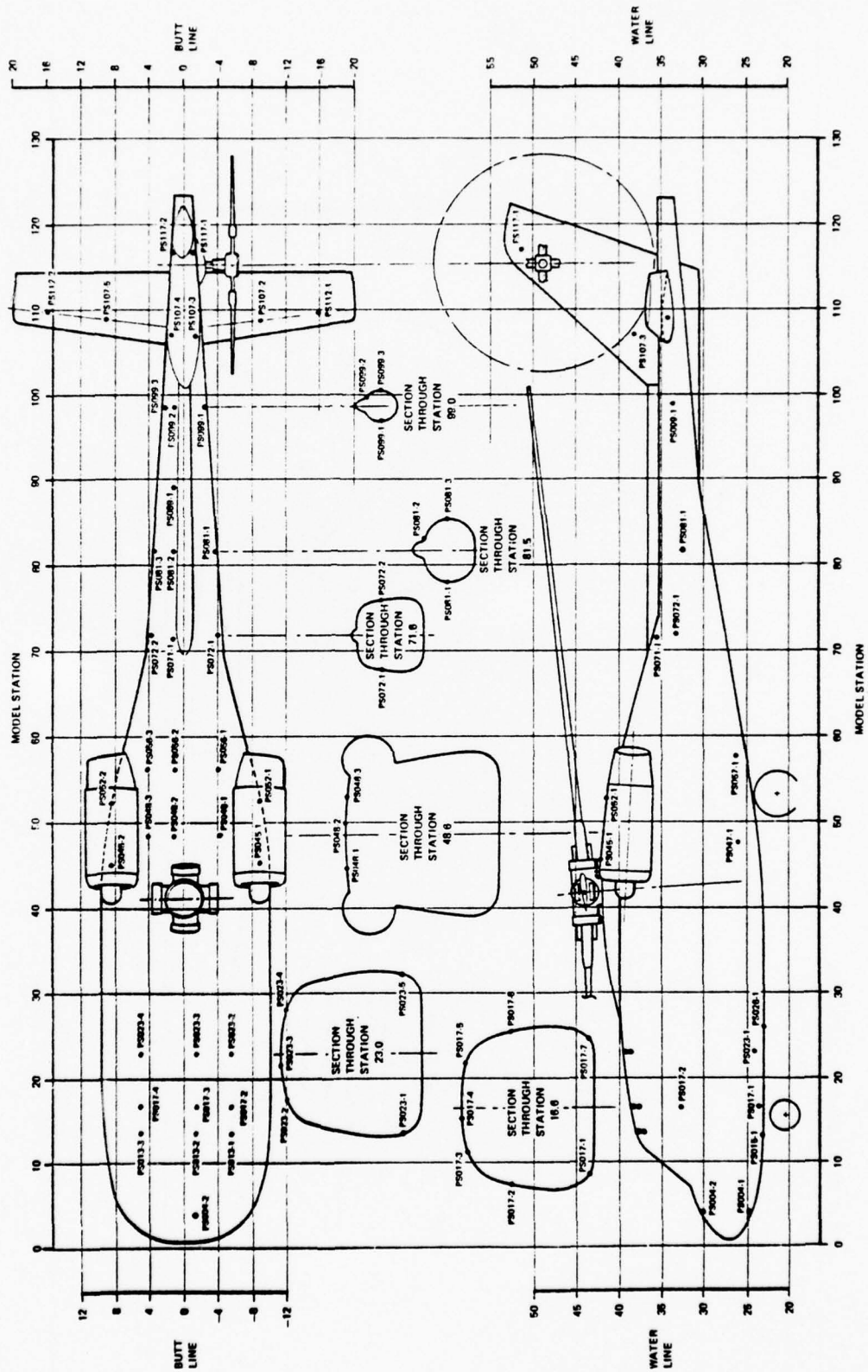


FIGURE 7 -1/4.85 SCALE MODEL GEOMETRY AND SURFACE PRESSURE TRANSDUCER LOCATIONS

TABLE 4  
1/3 OCTAVE BAND IDENTIFICATION

BAND NUMBER	BAND WIDTH - Hz		
	MINIMUM	CENTER	MAXIMUM
0	3.5	3.4	4.4
1	4.4	4.9	5.5
2	5.5	6.2	7.0
3	7.0	7.8	8.7
4	8.7	9.8	11.0
5	11.0	12.4	13.9
6	13.4	15.6	17.5
7	17.5	19.7	22.1
8	22.1	24.8	27.8
9	27.8	31.25	35.1
10	35.1	39.4	44.2
11	44.2	49.6	55.7
12	55.7	62.5	70.2
13	70.2	78.7	88.9
14	88.9	99.2	111.4
15	111.4	125.0	140.3
16	140.3	157.5	176.8
17	176.8	198.4	222.7
18	222.7	250.0	280.6

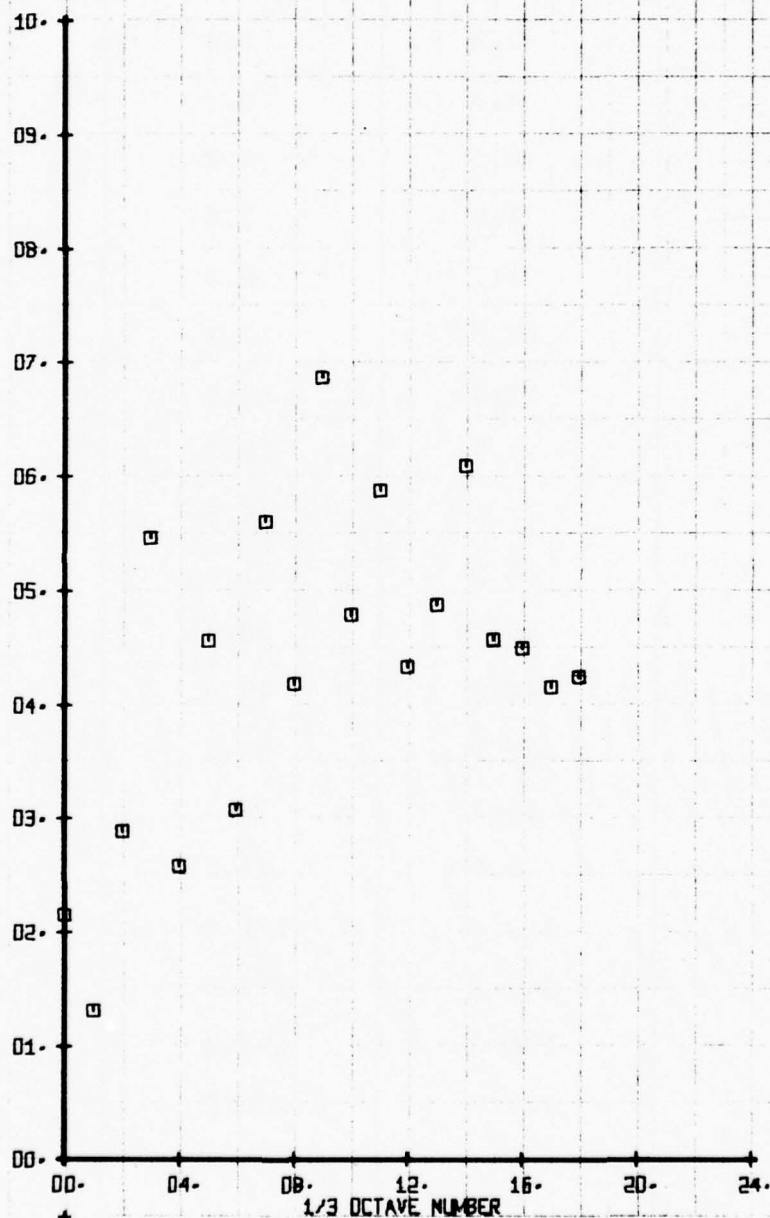
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CVRS 160 FAIRING  
RUN 154 TP 2

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



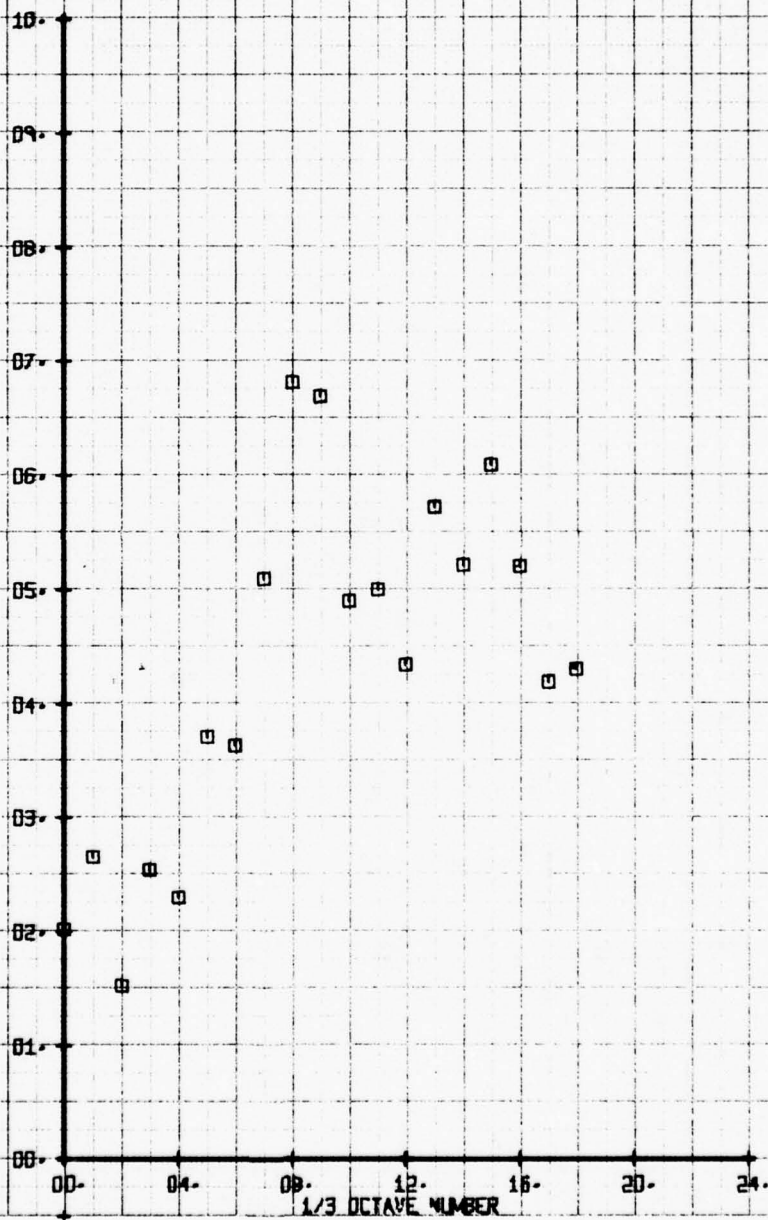
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 3

SYM  
 □

CM  
 66

LEGEND  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



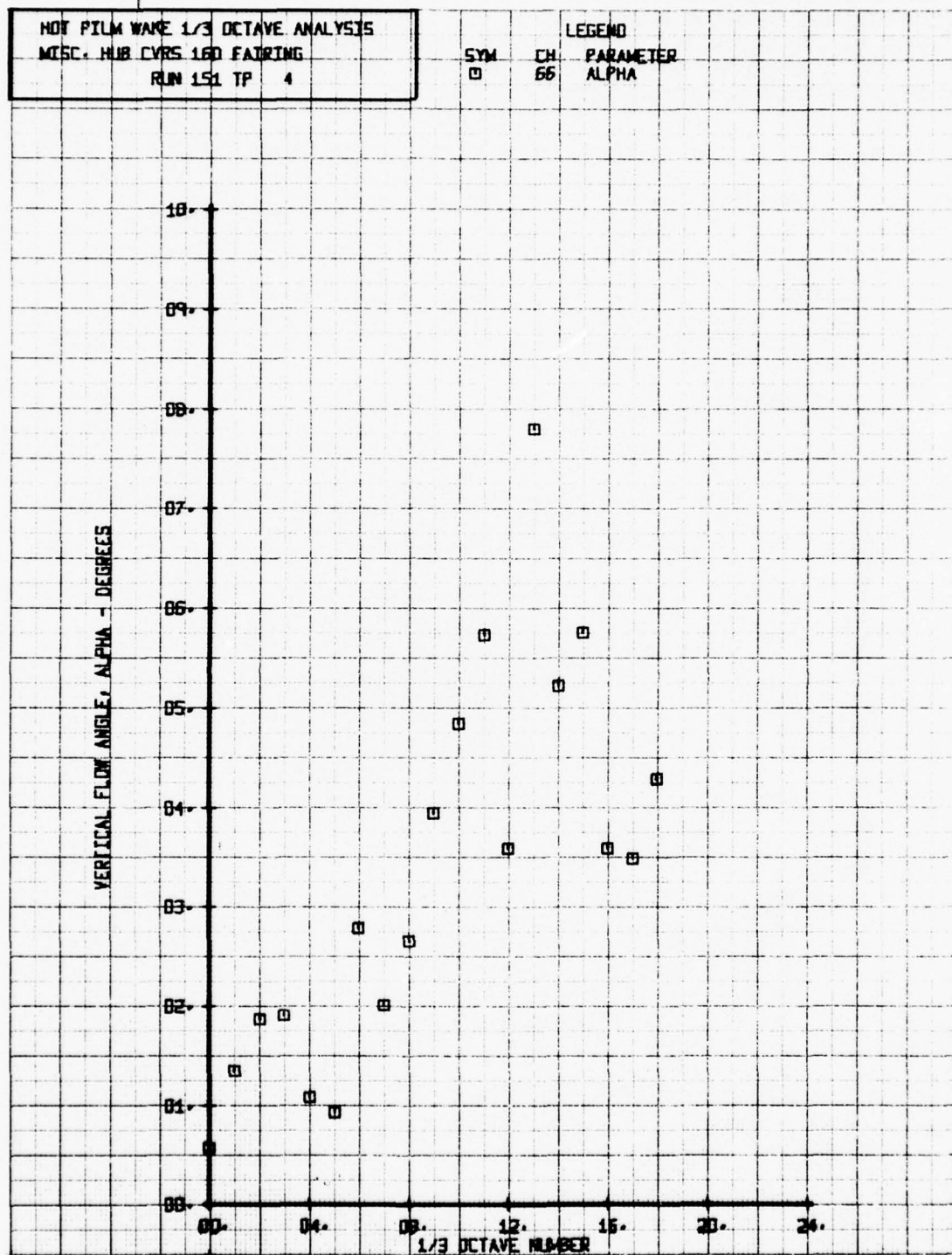


NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 4

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 ALPHA



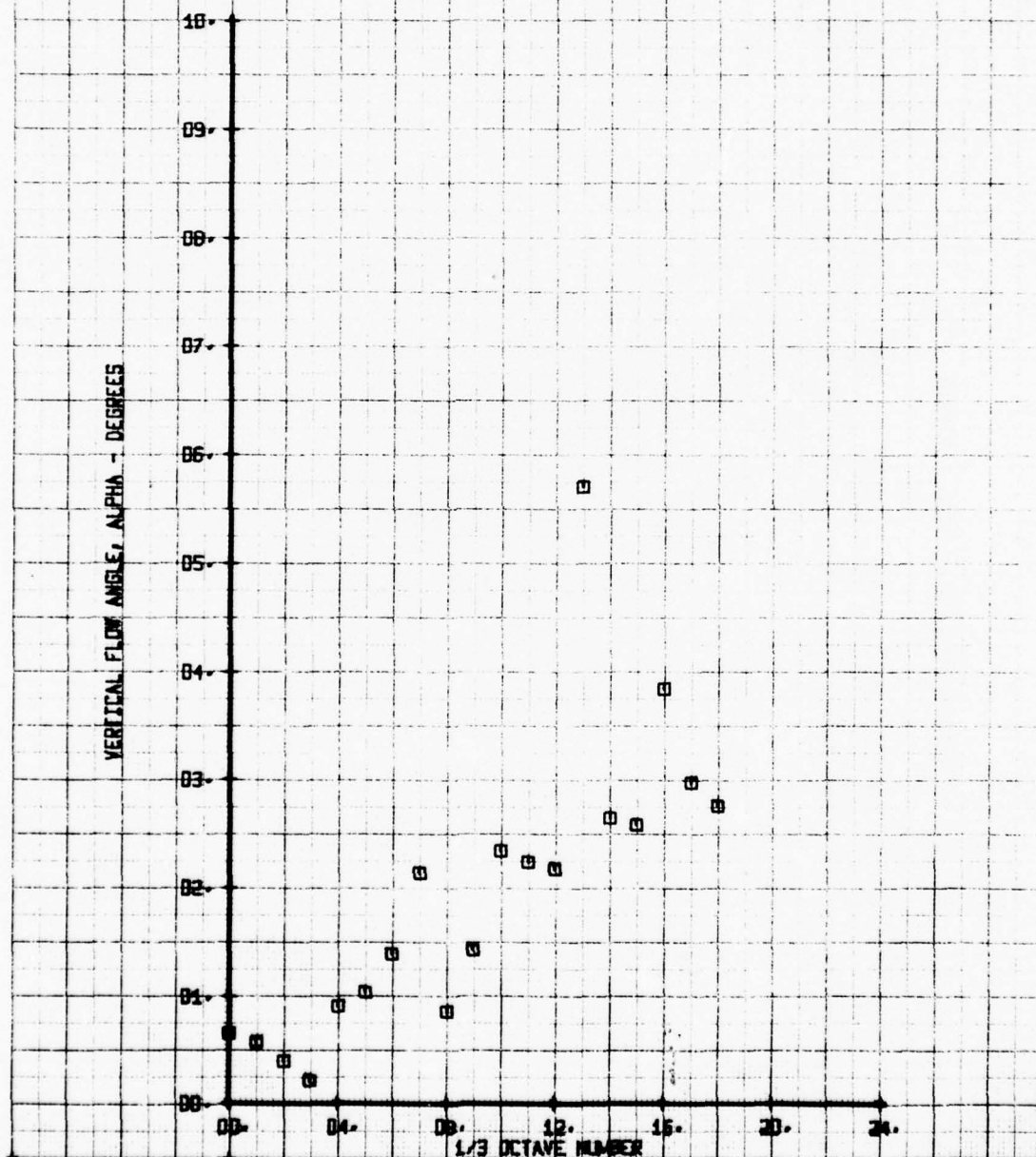
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS 160 FAIRING  
RUN 151 TP 5

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

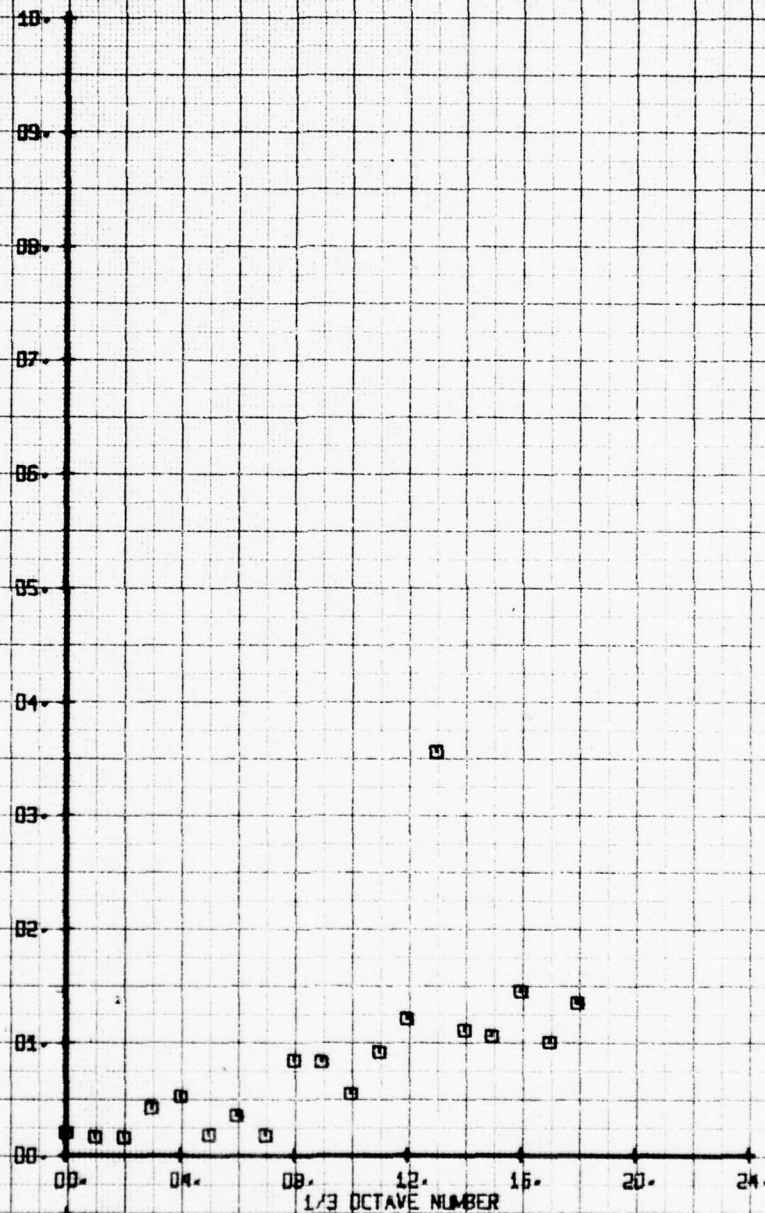
VERTICAL FLOW ANGLE, ALPHA - DEGREES



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FATRONG  
 RUN 151 TP 6

LEGEND  
 SYM CH PARAMETER  
 □ 56 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES

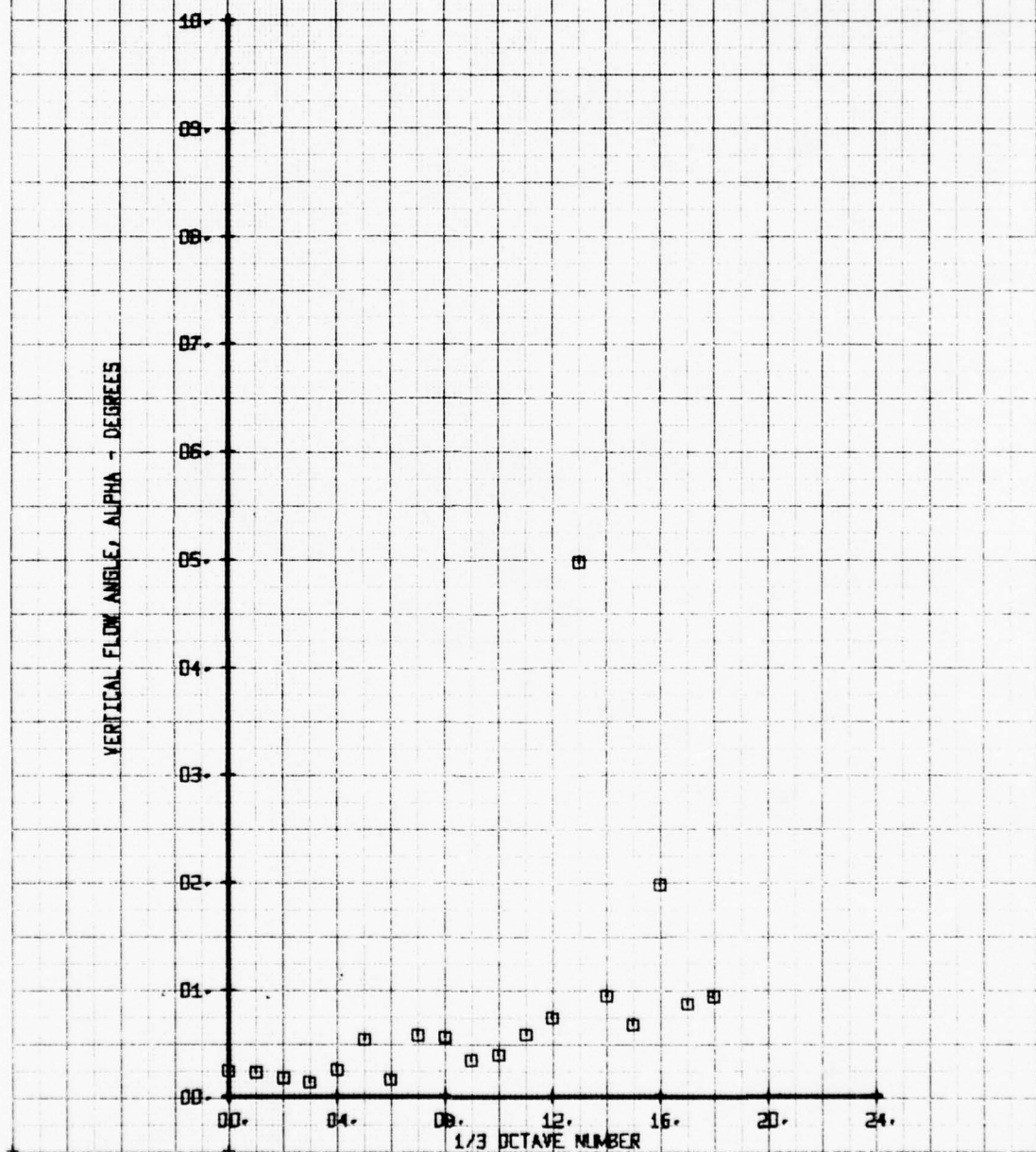


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 7

SYN  
 0

CH  
 66

LEGEND  
 PARAMETER  
 ALPHA





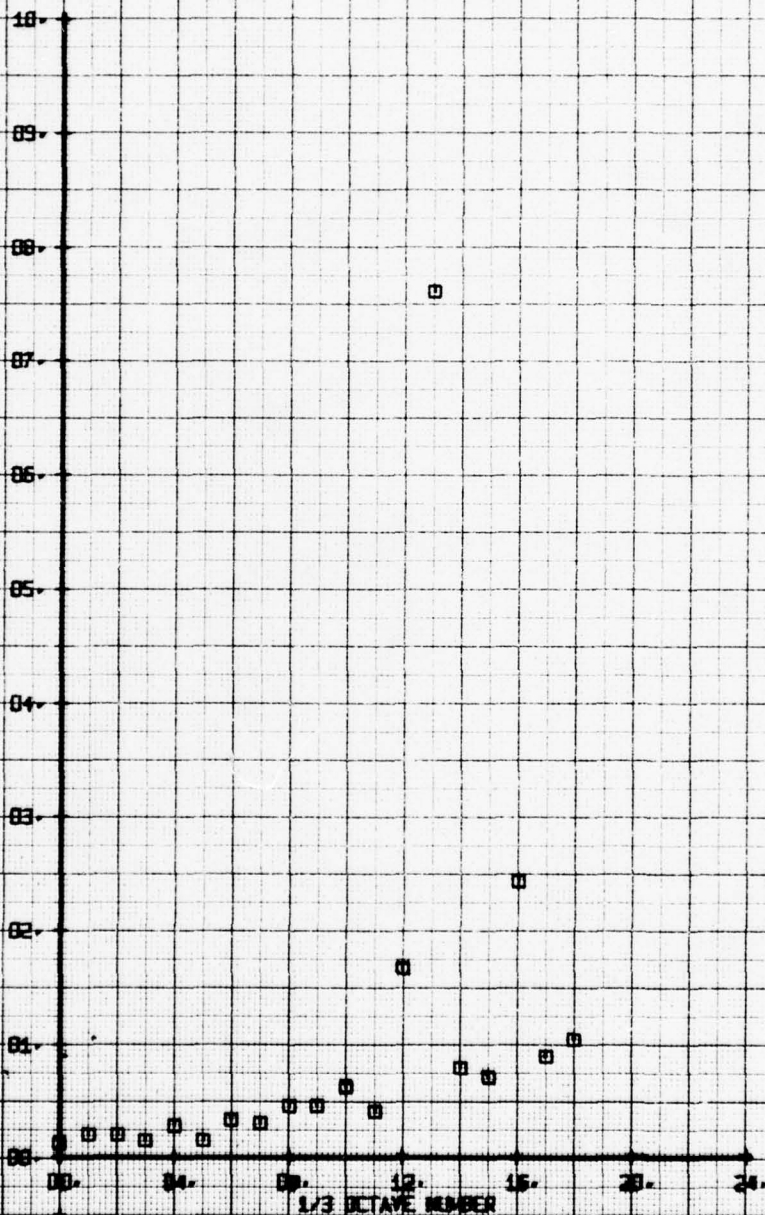
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 180 FAIRING  
 RUN 151 TP B

SYM  
 0

CH  
 66

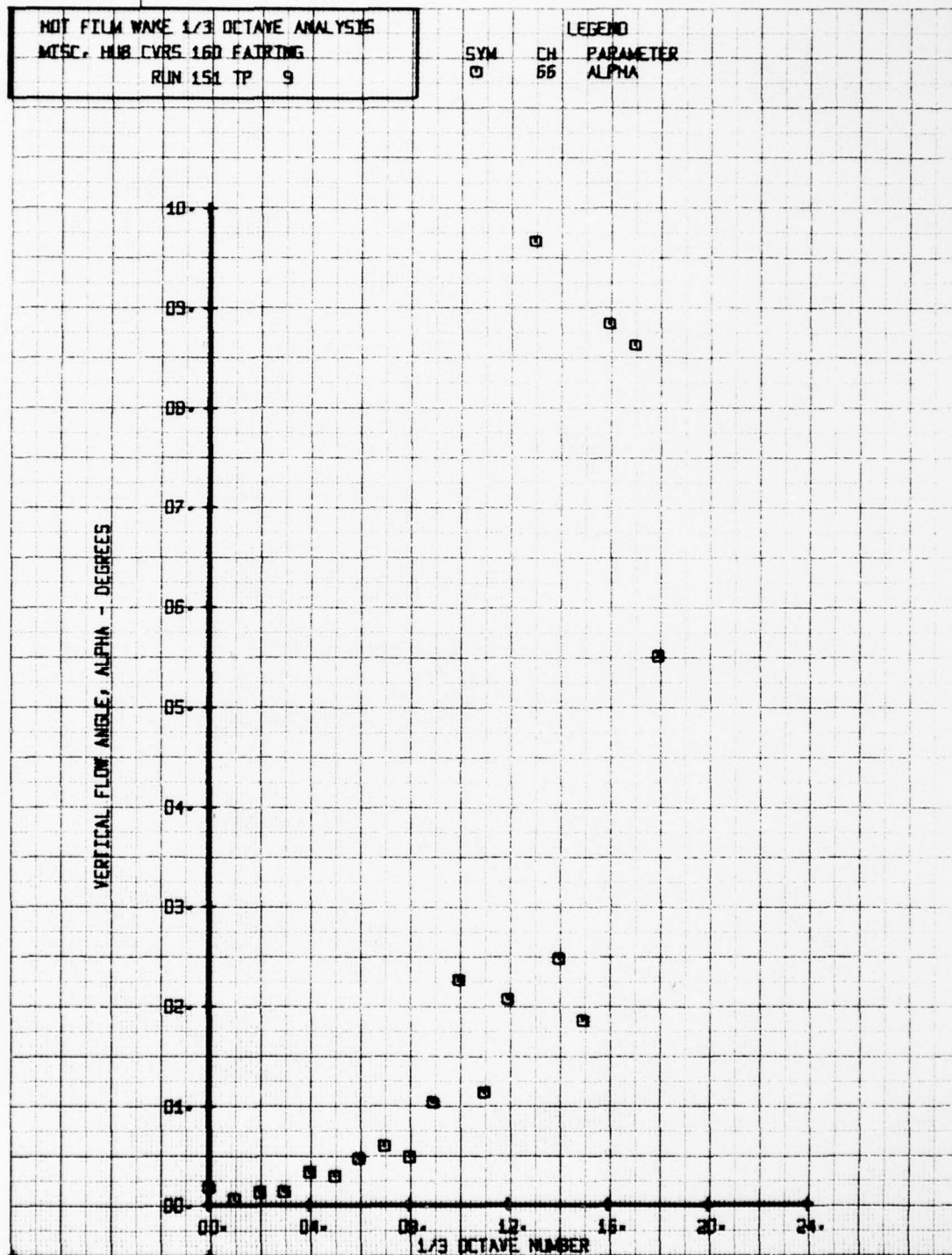
LEGEND  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 9

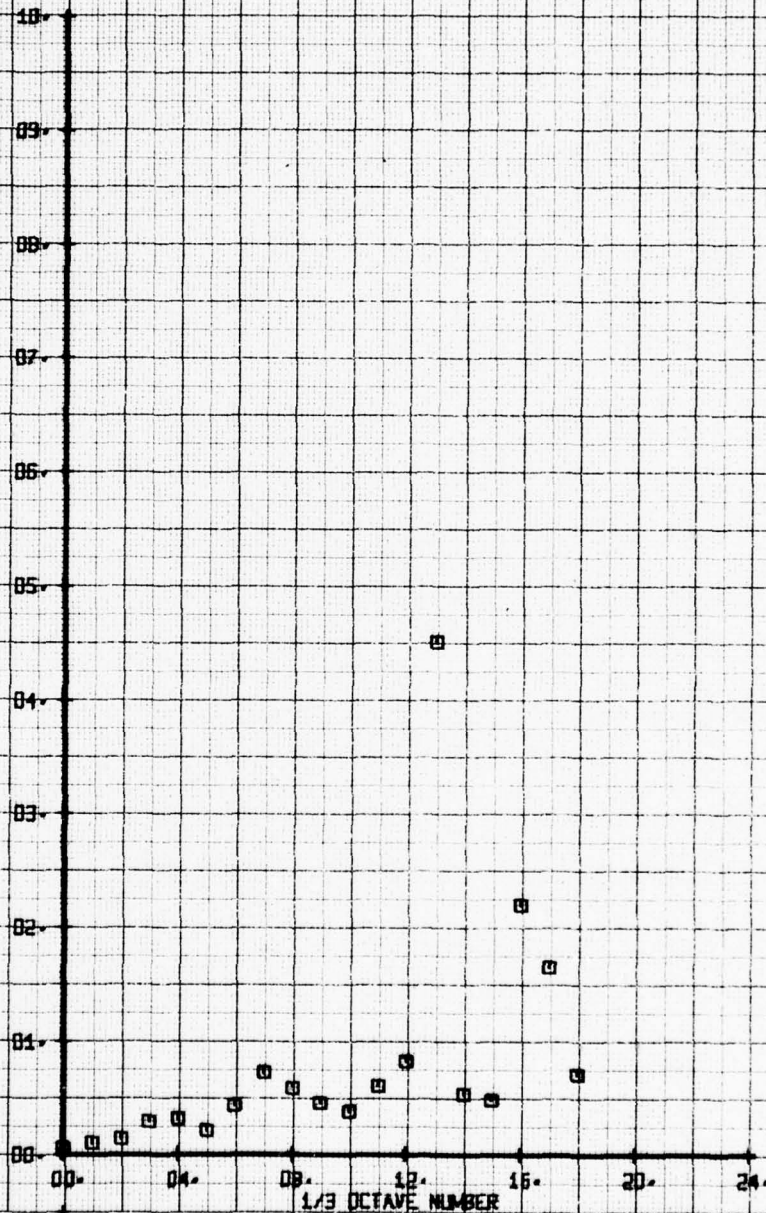
LEGEND  
 SYM CH PARAMETER  
 □ 66 ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 10

SYM	CH	PARAMETER
□	55	ALPHA

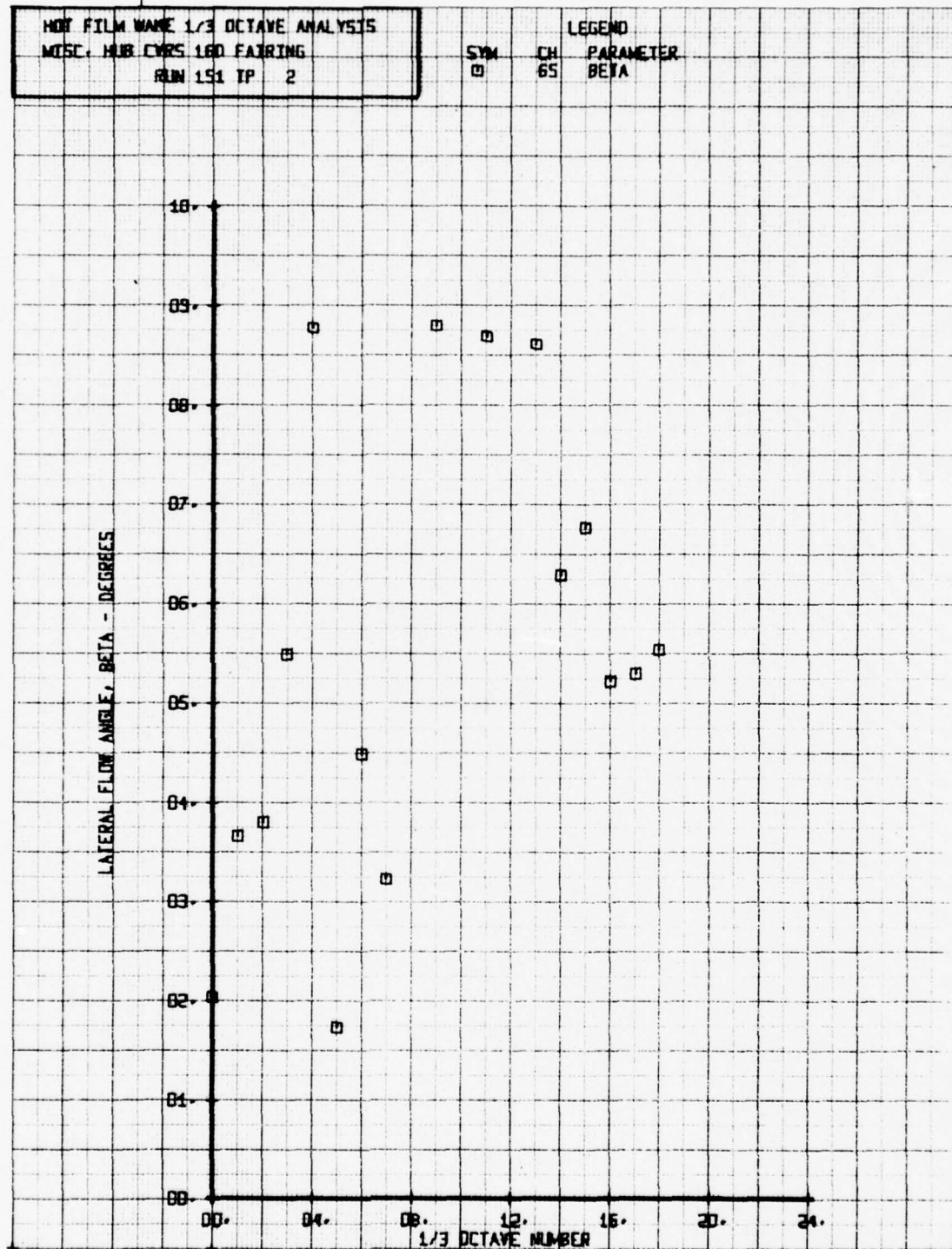
VERTICAL FLOW ANGLE, ALPHA - DEGREES





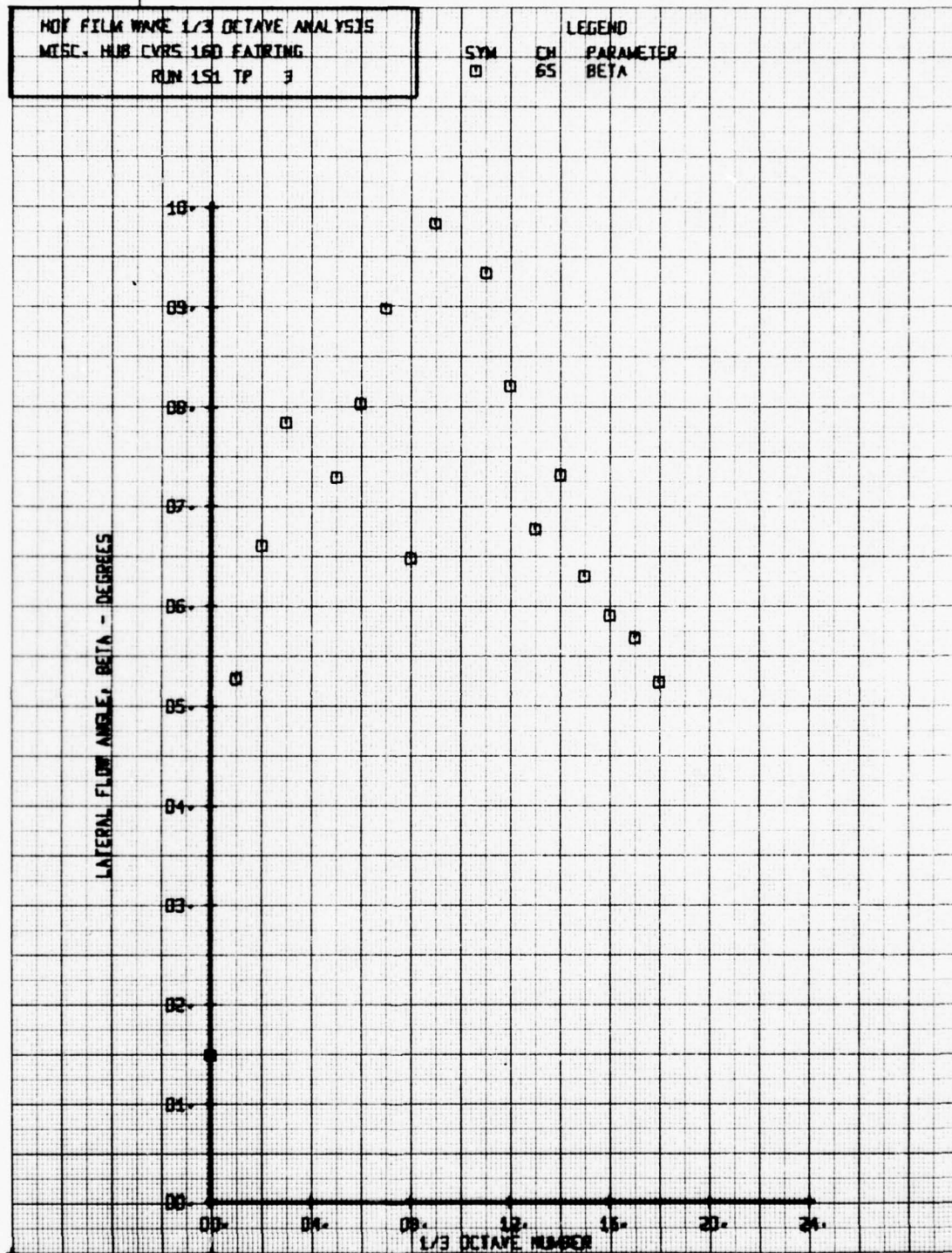
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 2

SYN CH LEGEND  
 0 65 PARAMETER  
 BETA



NOF FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 3

LEGEND  
 SYM CH PARAMETER  
 □ 65 BETA





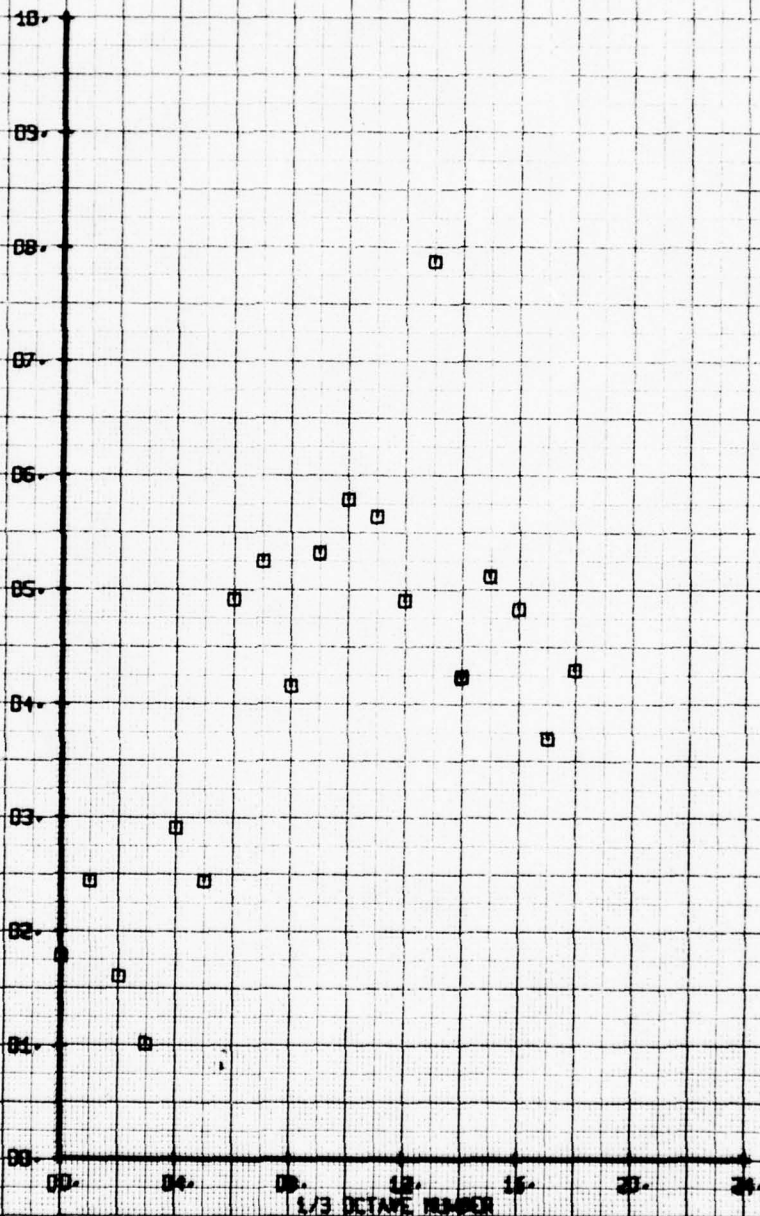
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 4

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



# NOT FILM WAVE 1/3 OCTAVE ANALYSIS

MISC. MISC CYES 180 FAIRING

RUN 151 TP 5

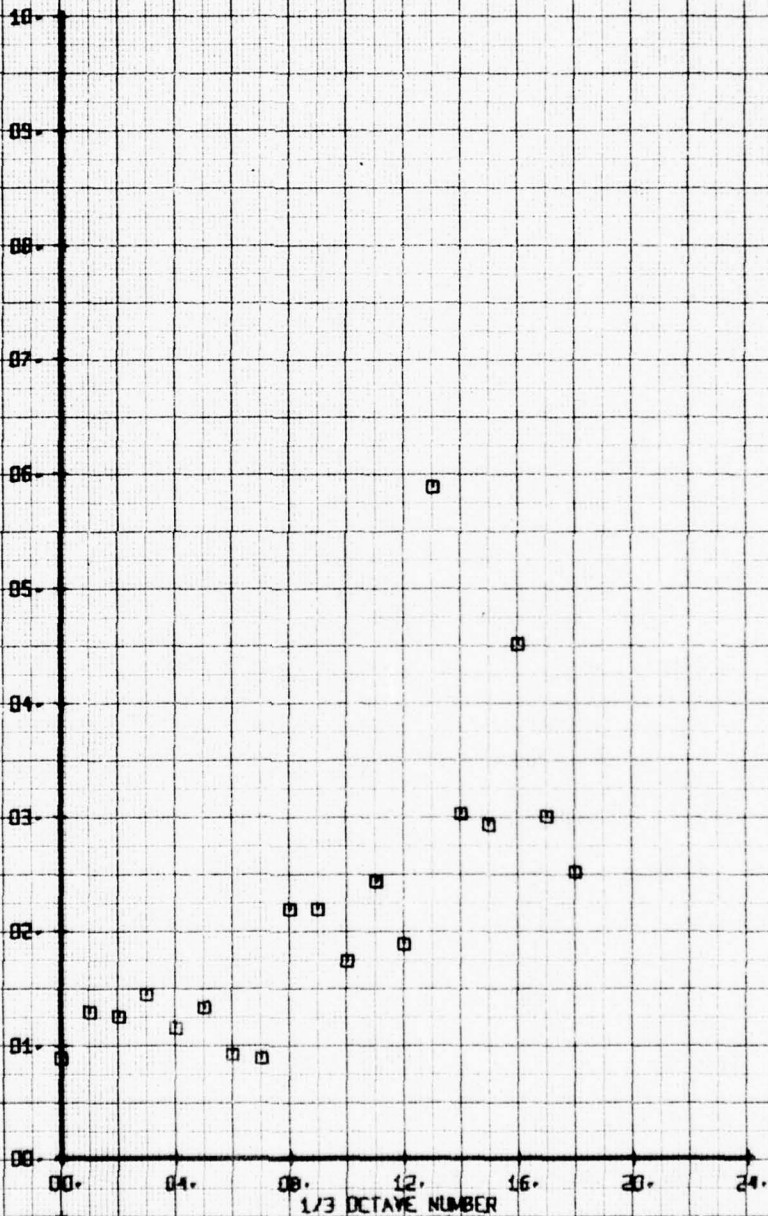
SYM  
Q

CH  
65

## LEGEND

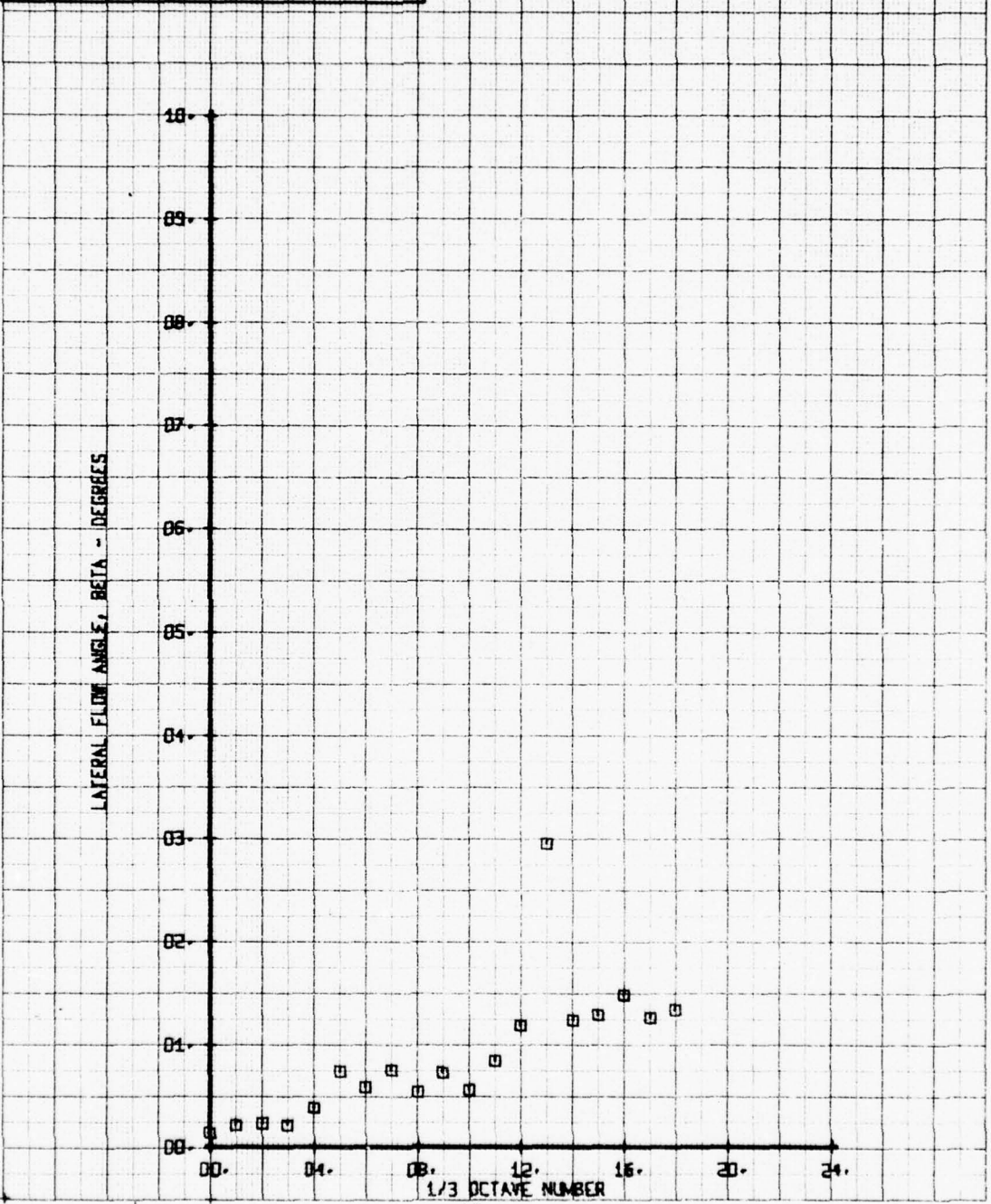
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. MUR CYRS 160 FAIRING  
 RUN 191 TP 6

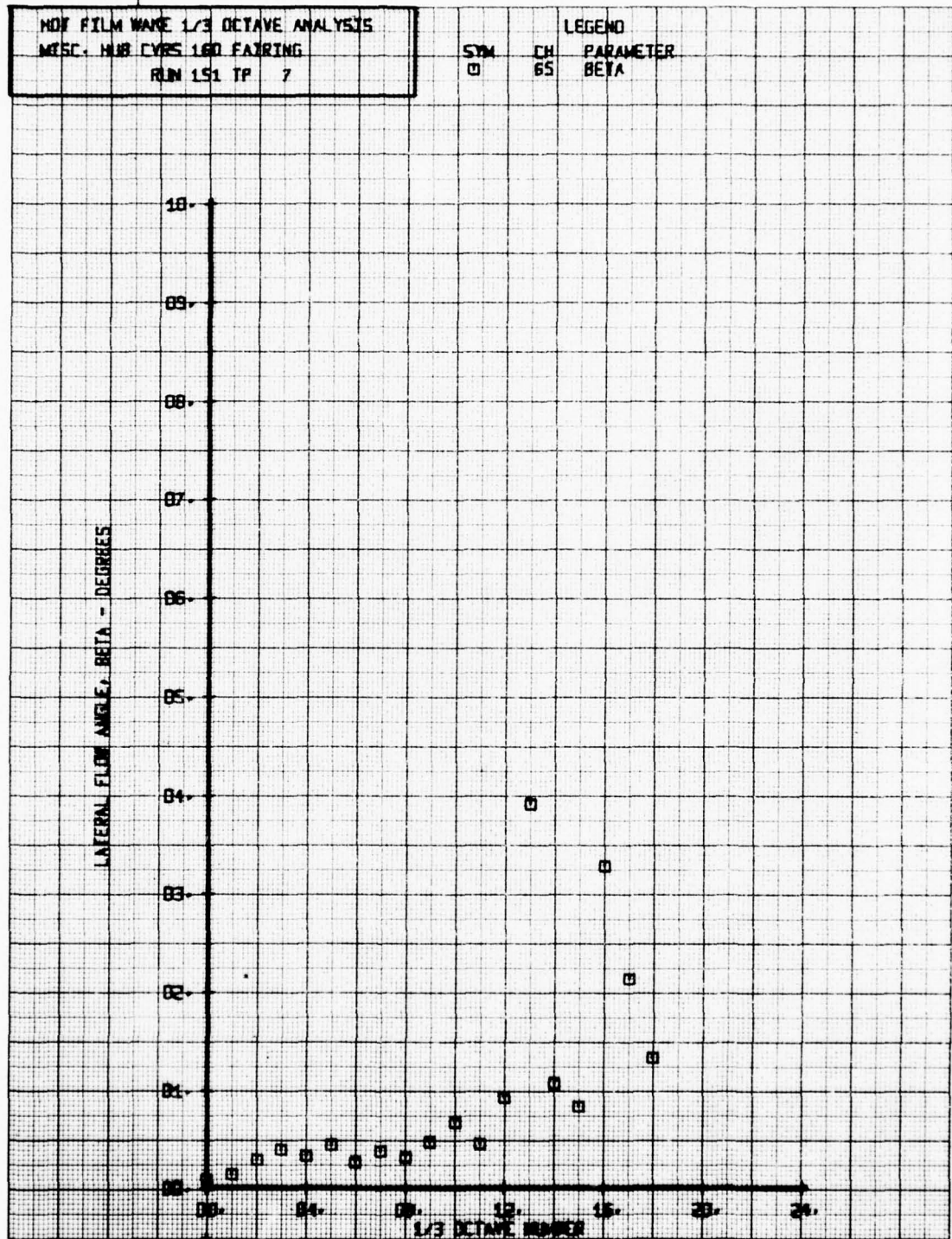
SYM	CH	LEGEND	PARAMETER
□	65		BETA





NOV FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 7

SYM	CH	LEGEND
□	65	PARAMETER BETA



# HOT FILM WAKE 1/3 OCTAVE ANALYSIS

MSC. HUB CWS 160 FAIRING

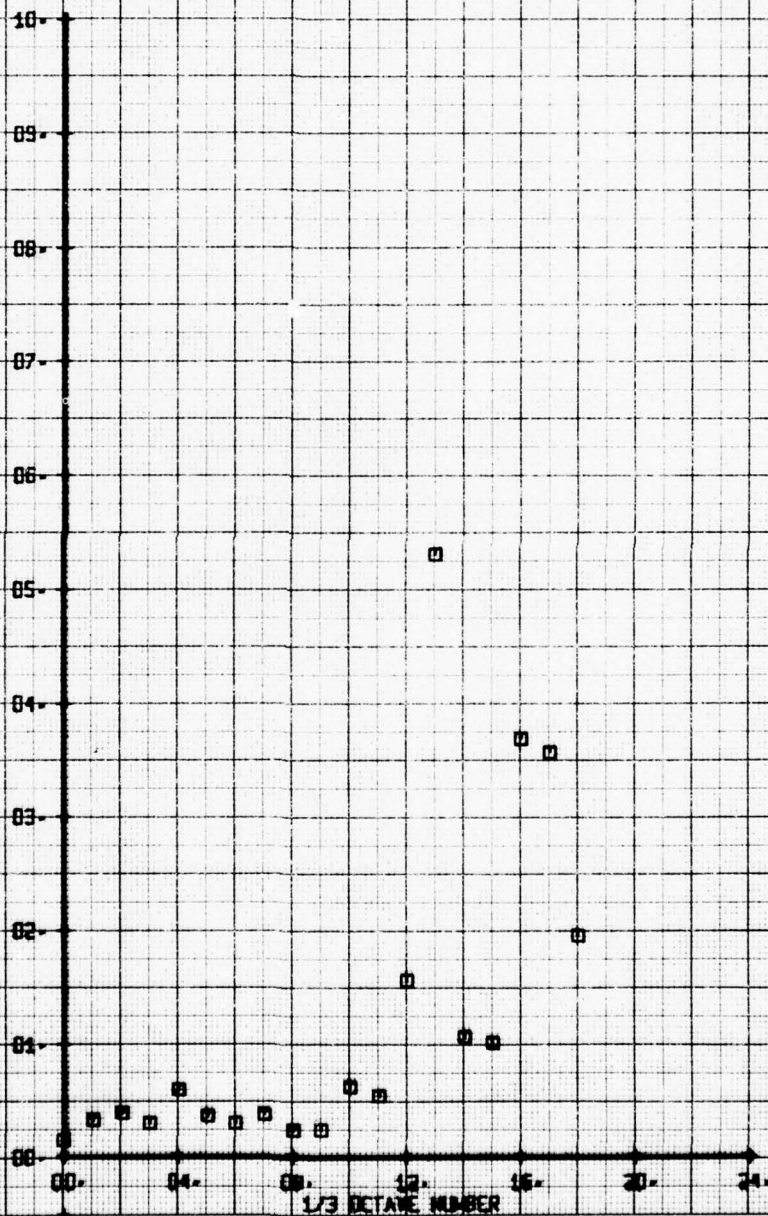
RUN 151 TP B

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES

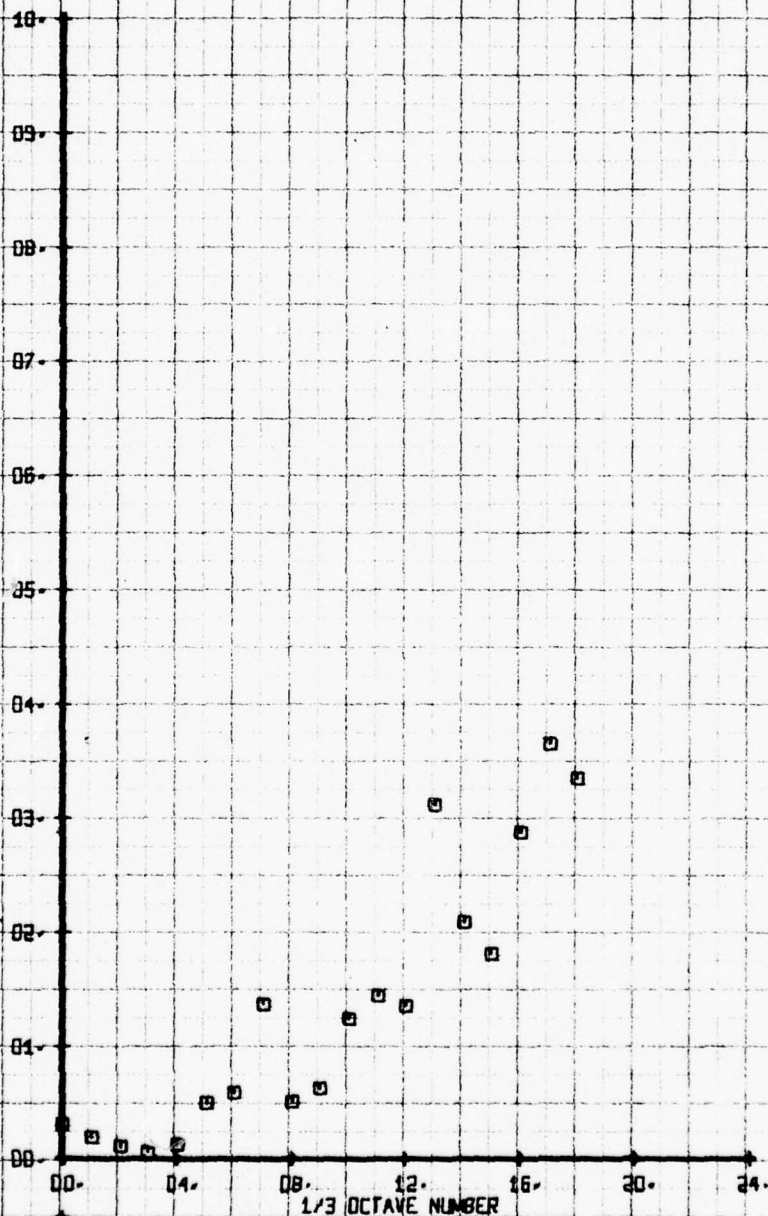




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 180 FAIRING  
 RUN 151 TP 9

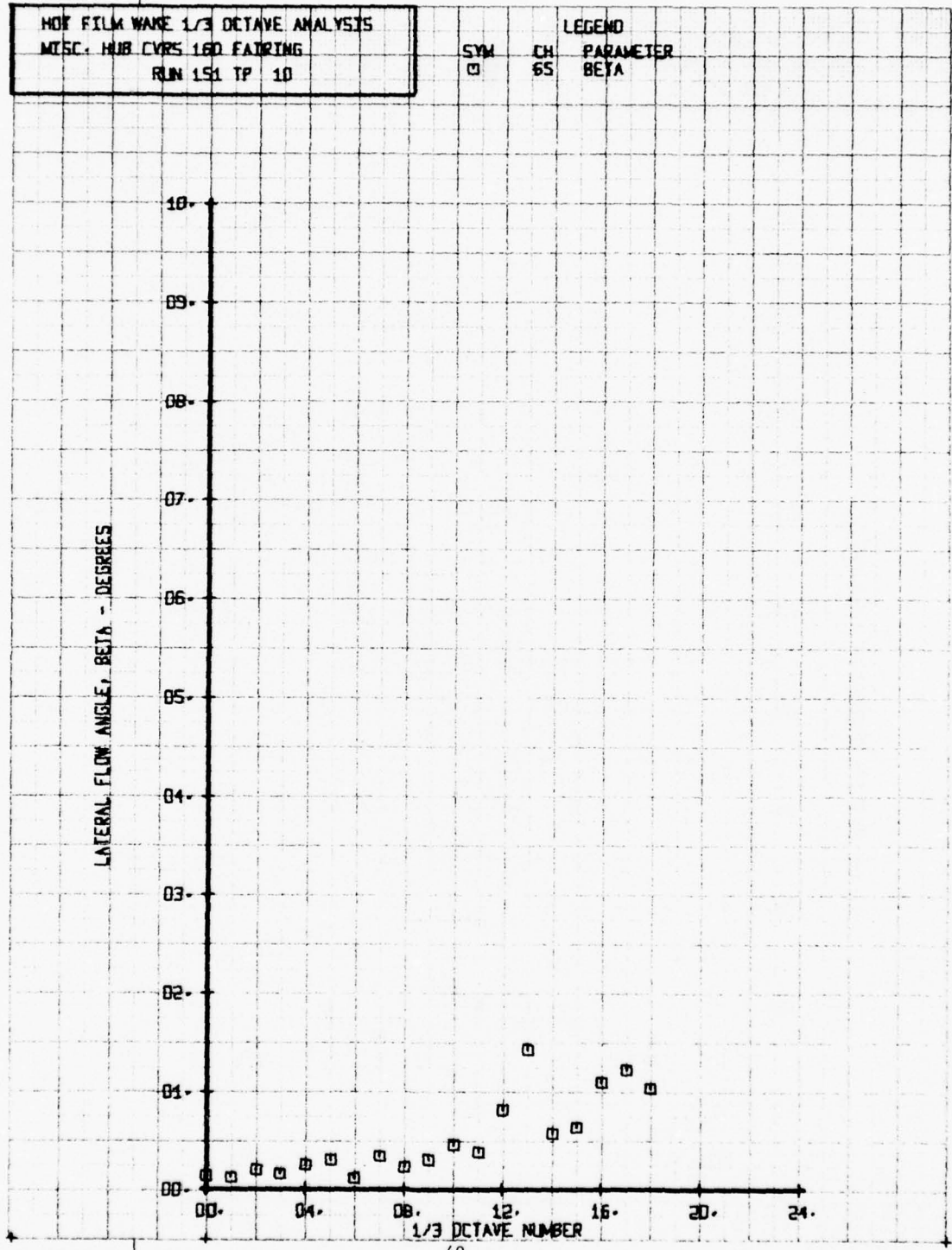
LEGEND  
 SYM CH PARAMETER  
 □ 65 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 180 FAIRING  
 RUN 151 TP 10

SYM	CH	LEGEND	PARAMETER
□	65		BETA

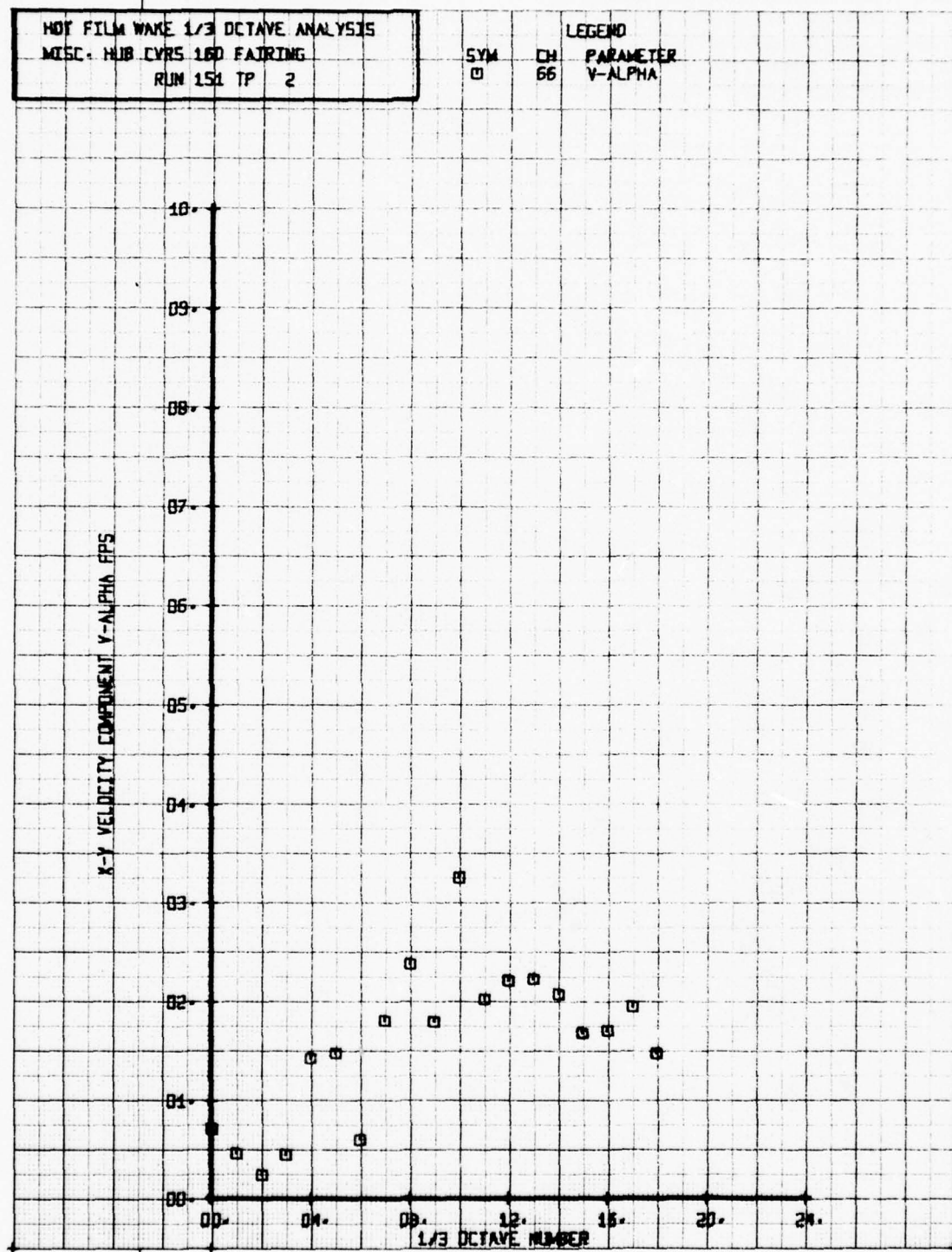


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 2

SYM  
 □

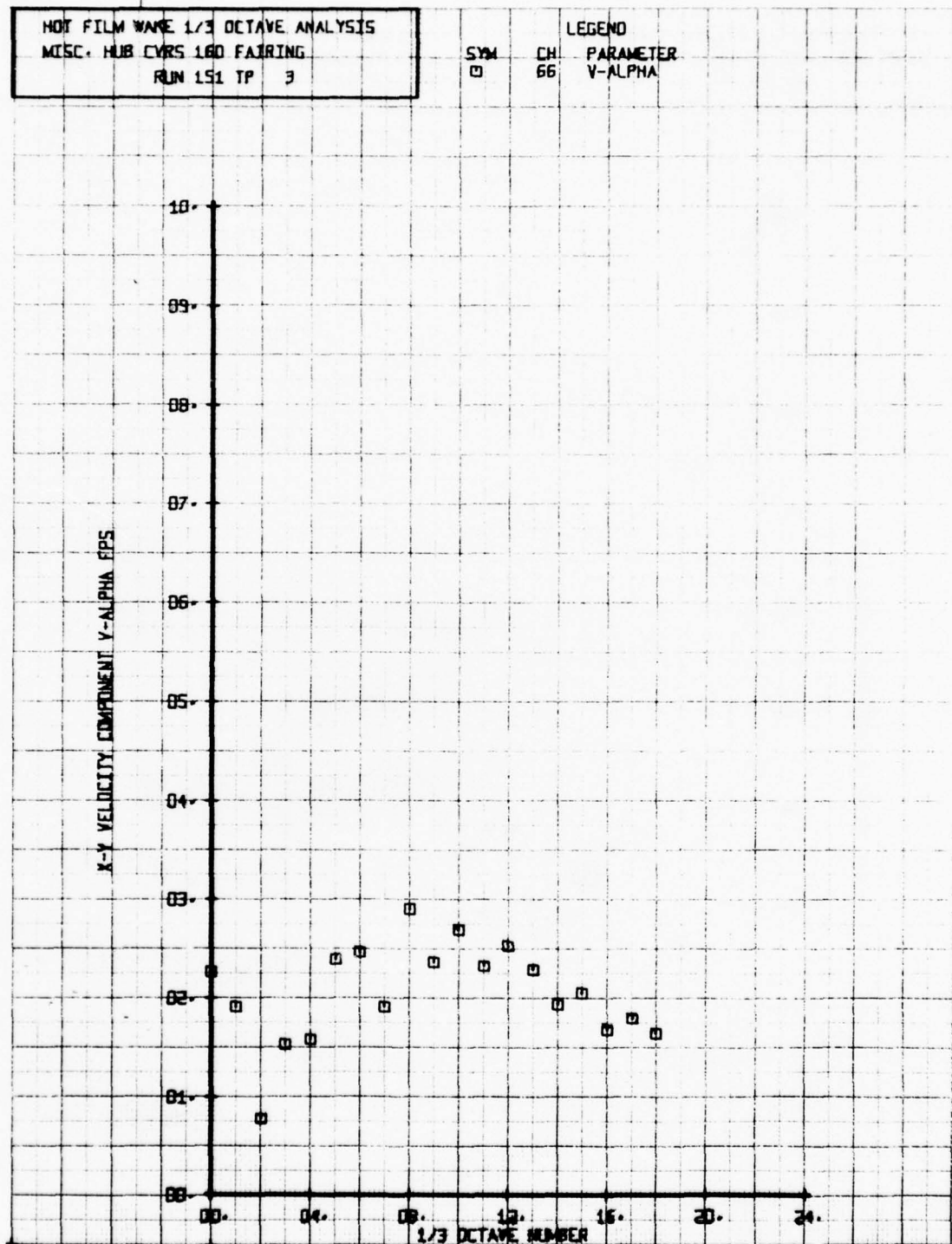
CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 180 FAIRING  
 RUN 151 TP 3

SYM	CH	PARAMETER
□	66	V-ALPHA



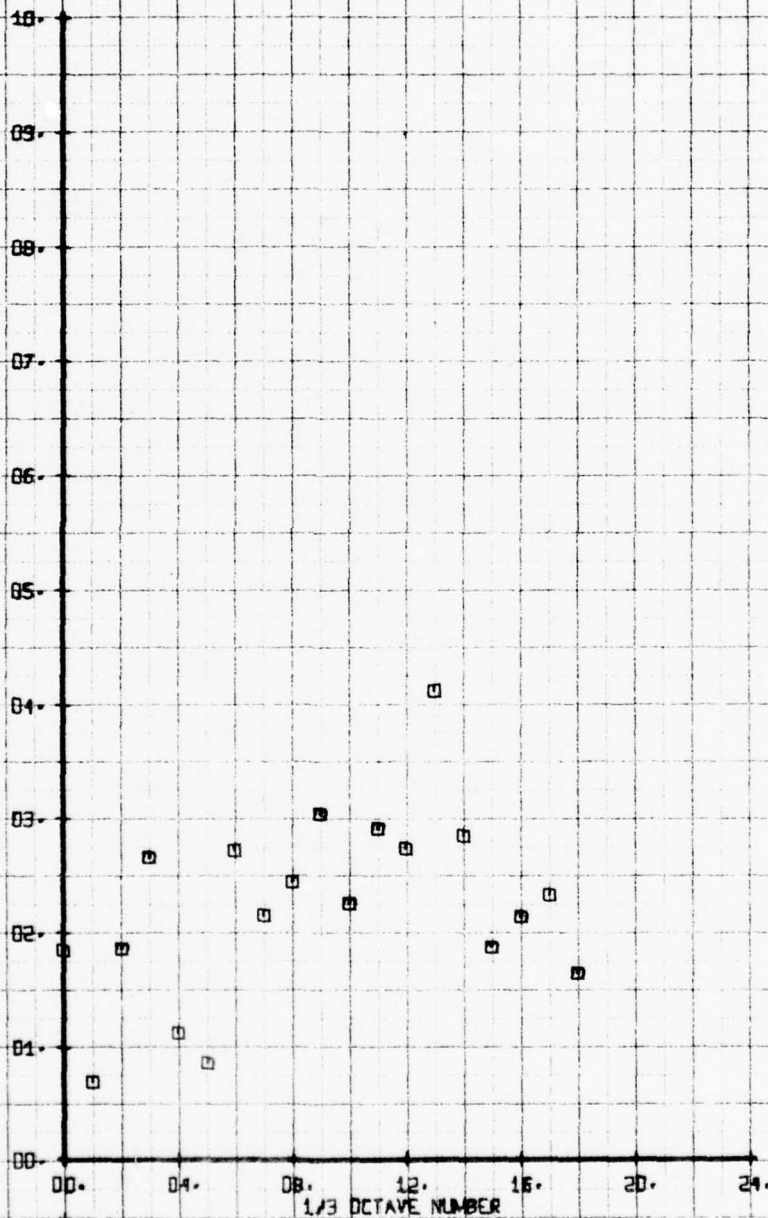


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MESC. HUB CYRS 180 FATHING  
 RUN 151 TP 4

SYM  
 □

LEGEND  
 CH 66  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS





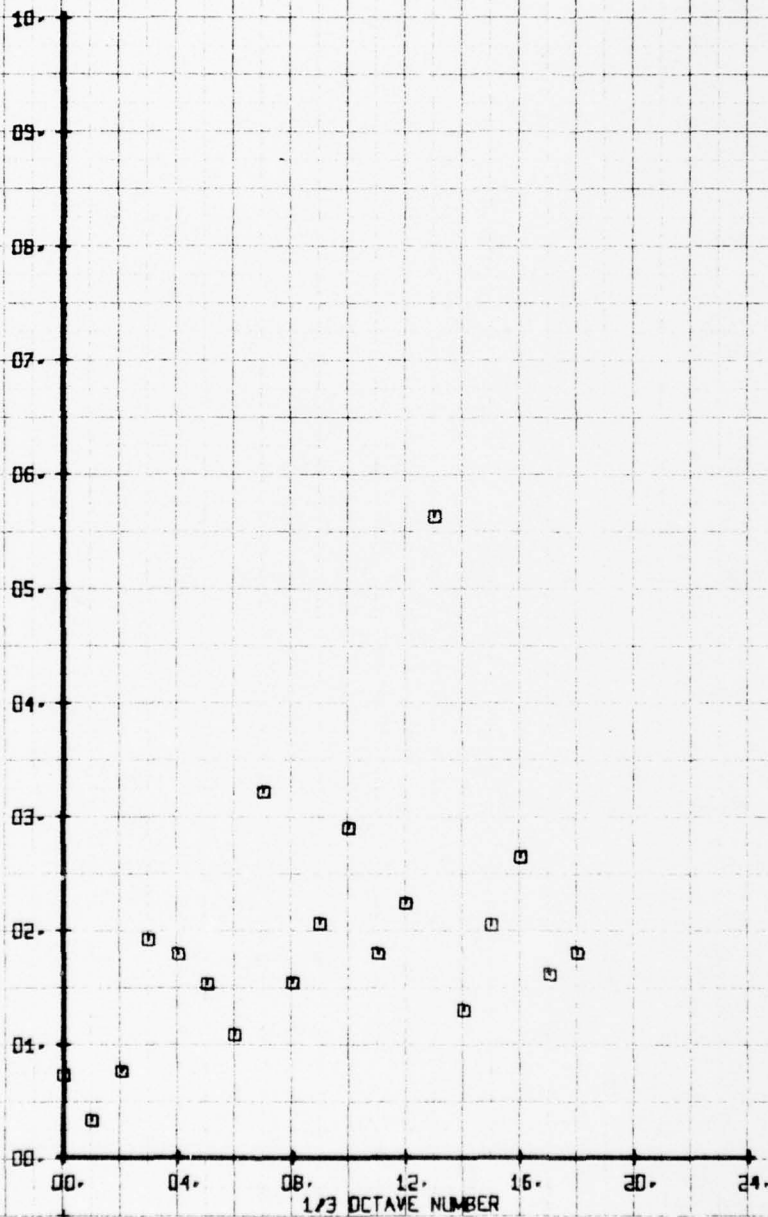
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CURS 180 FAIRING  
 RUN 151 TP 5

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



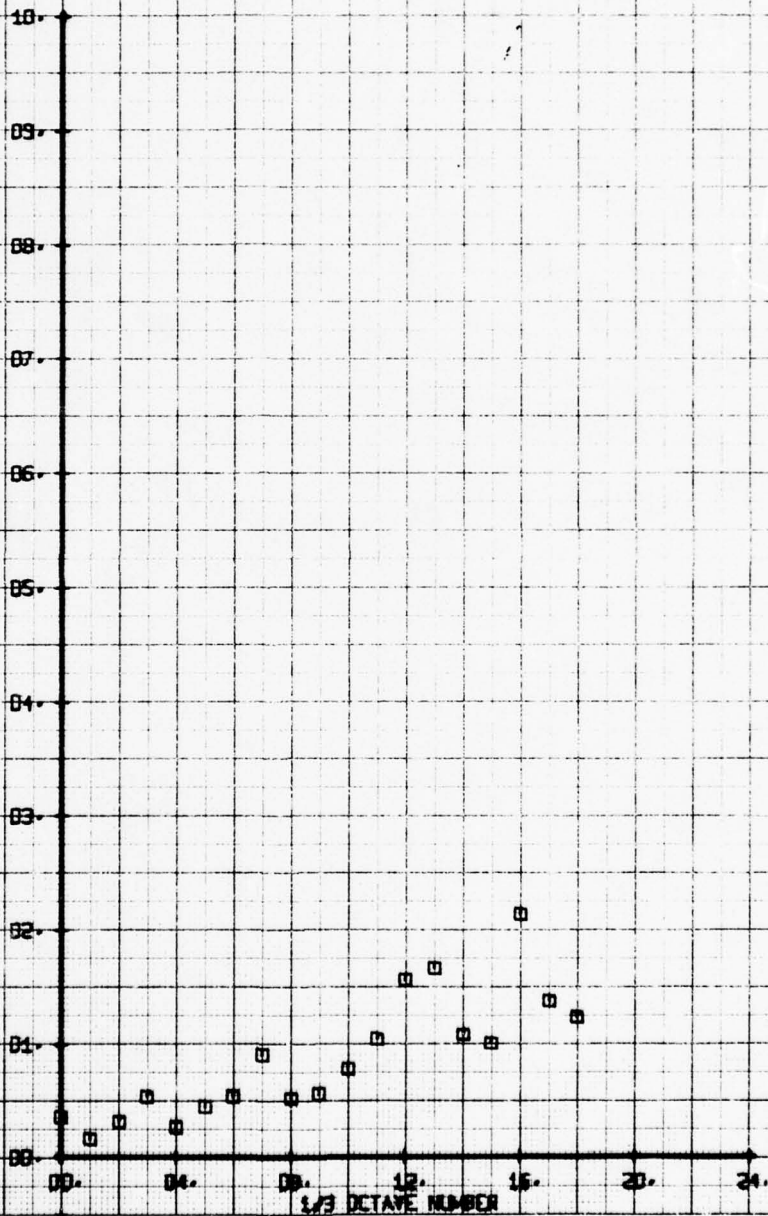
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 180 FAIRING  
 RUN 151 TP 6

SYM  
 □

LEGEND

CH PARAMETER  
 68 10-ALPHA

X-Y VELOCITY COMPONENT Y-ALPHA FPS



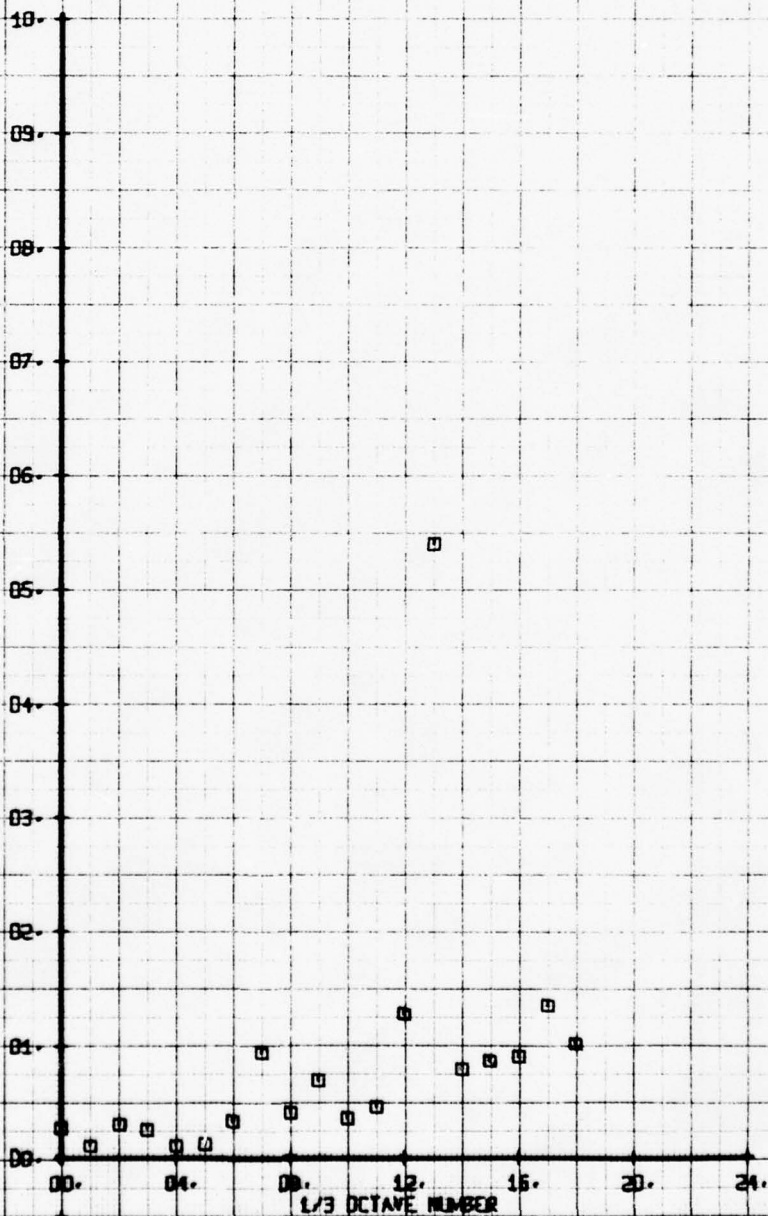
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FAIRING  
 RUN 151 TP 7

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



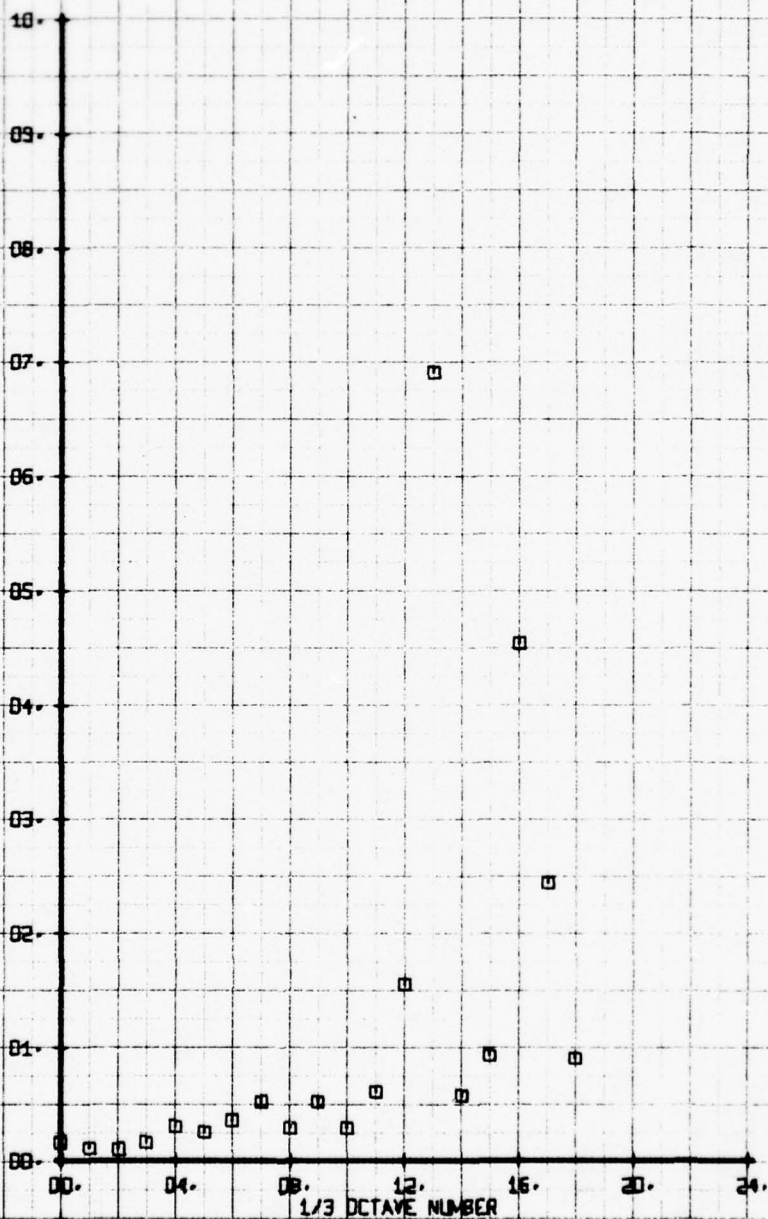
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 180 FAIRING  
 RUN 151 TP B

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA EPS





NOT FILM WAVE 1/3 OCTAVE ANALYSIS

MISC. HUB CYRS 160 FAIRING

RUN 151 TP 9

SYM

0

CH

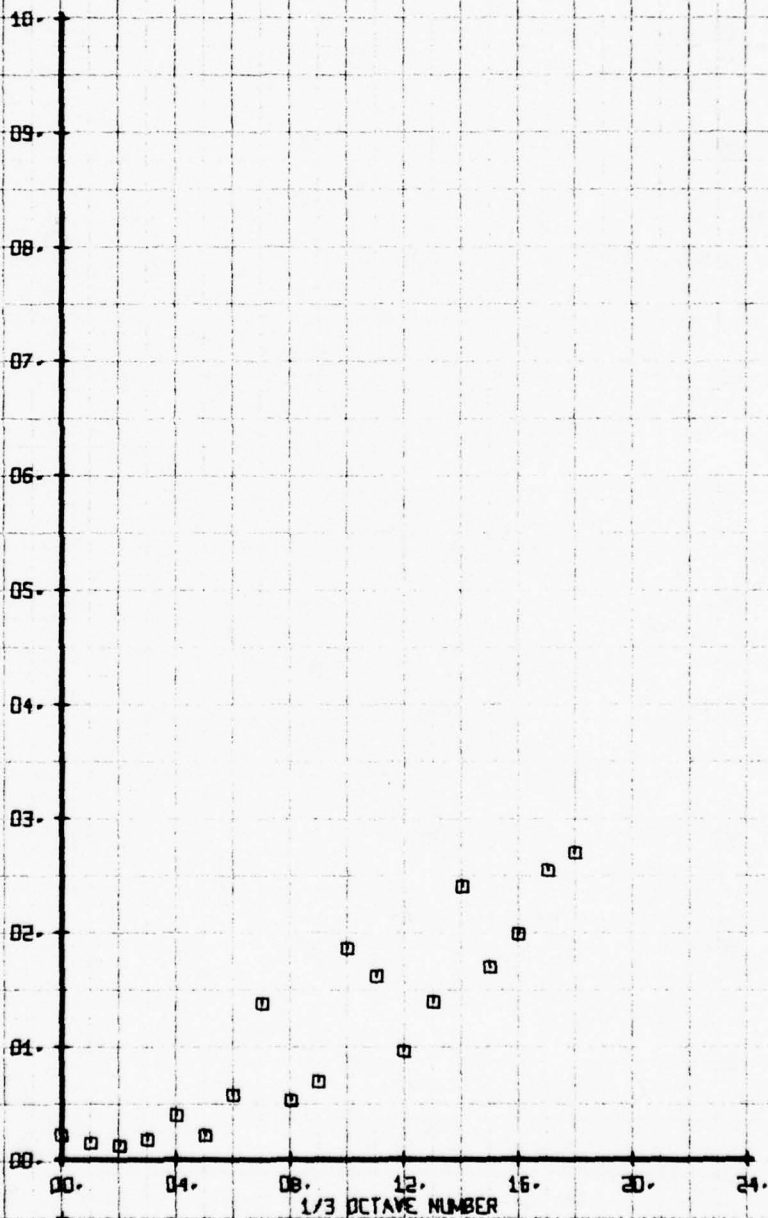
66

LEGEND

PARAMETER

V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CVRS 160 FAIRING  
RUN 151 TP 10

SYM  
□

CH  
66

LEGEND  
PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS

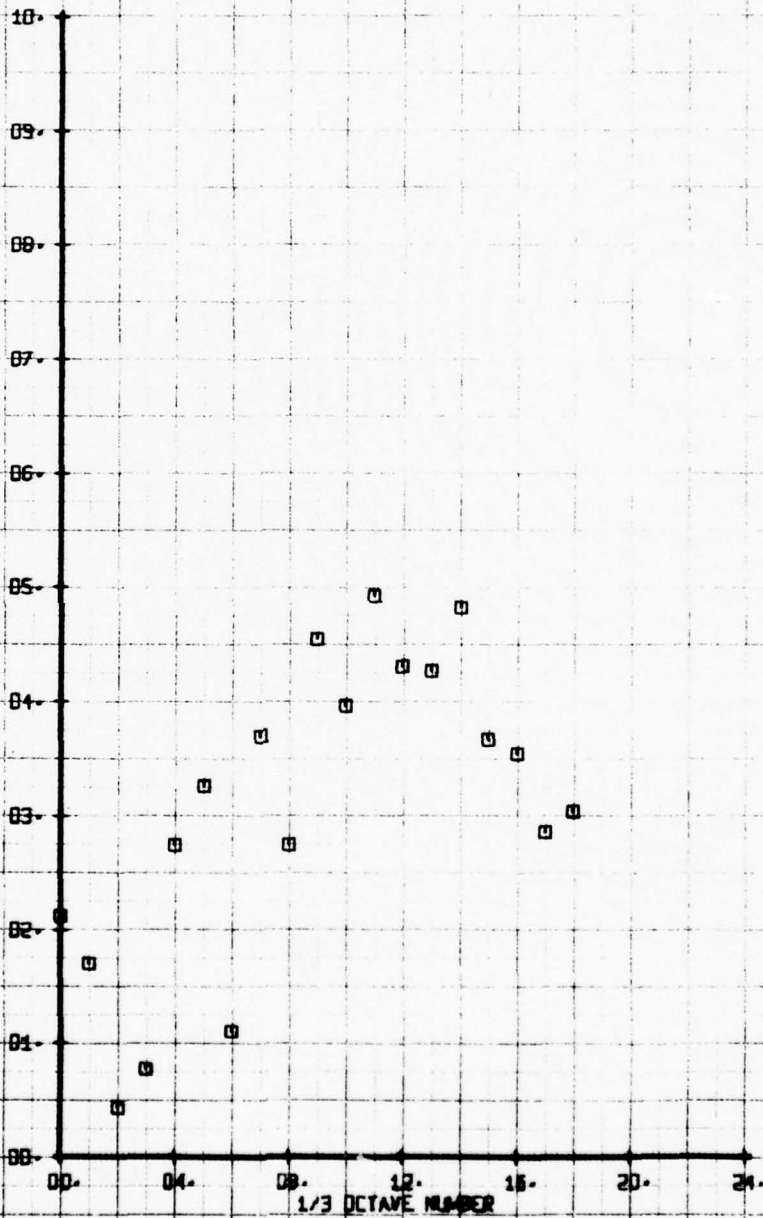
10.  
09.  
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01.  
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1/3 OCTAVE NUMBER

HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 2

SYN CH PARAMETER  
 0 65 V-BETA

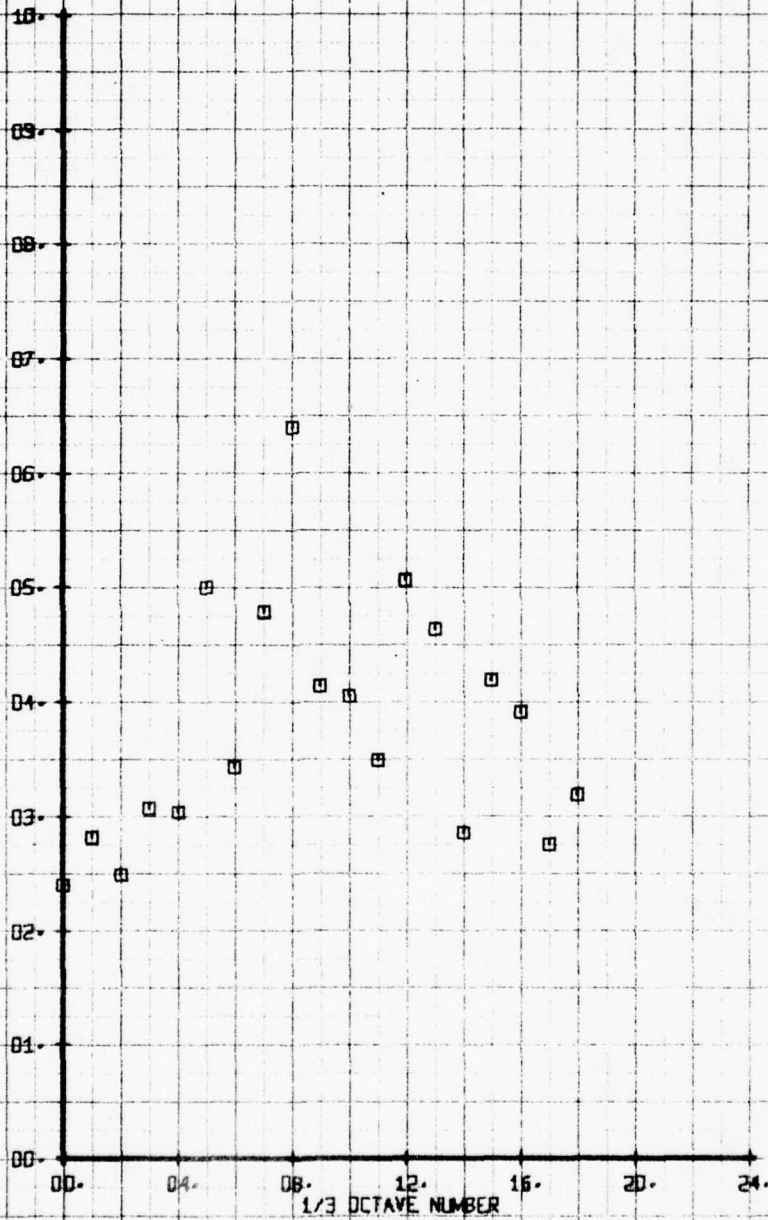
X-2 VELOCITY COMPONENT V-BETA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 3

SYM CH PARAMETER  
 □ 65 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



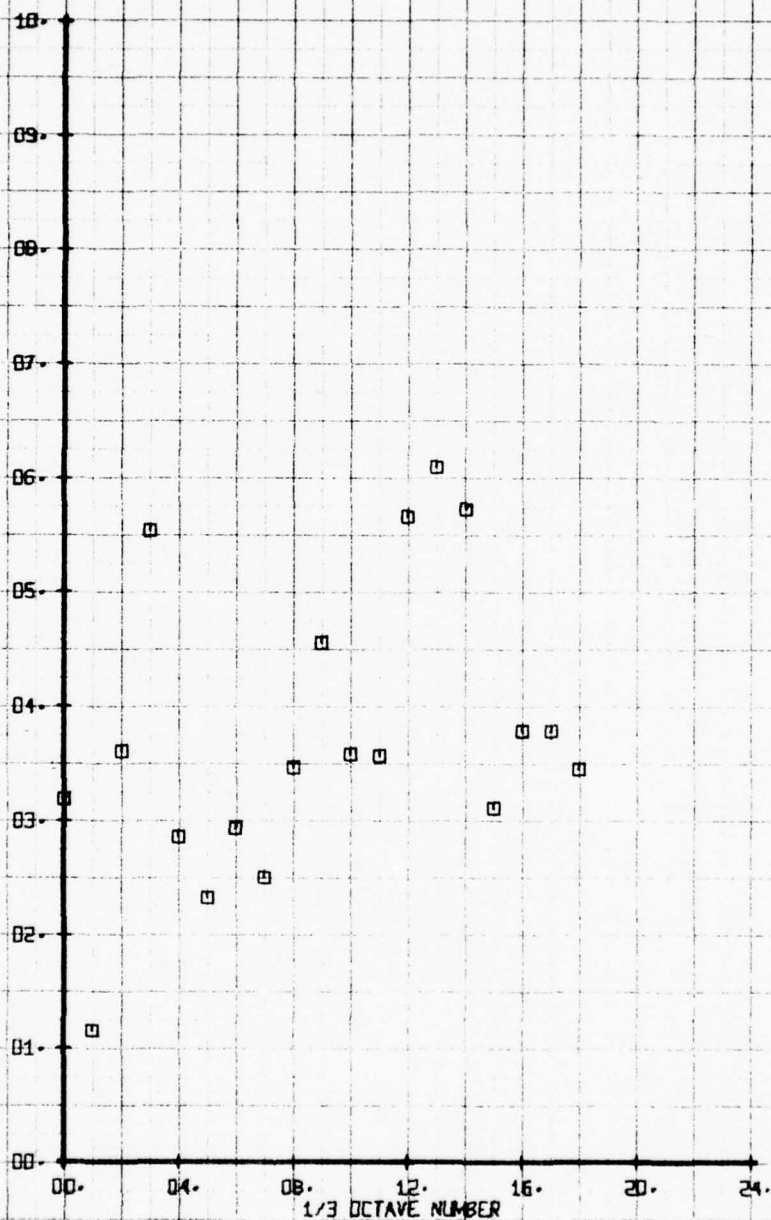
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS 160 FATHING  
 RUN 151 TP 4

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-Z VELOCITY COMPONENT V-BETA FPS





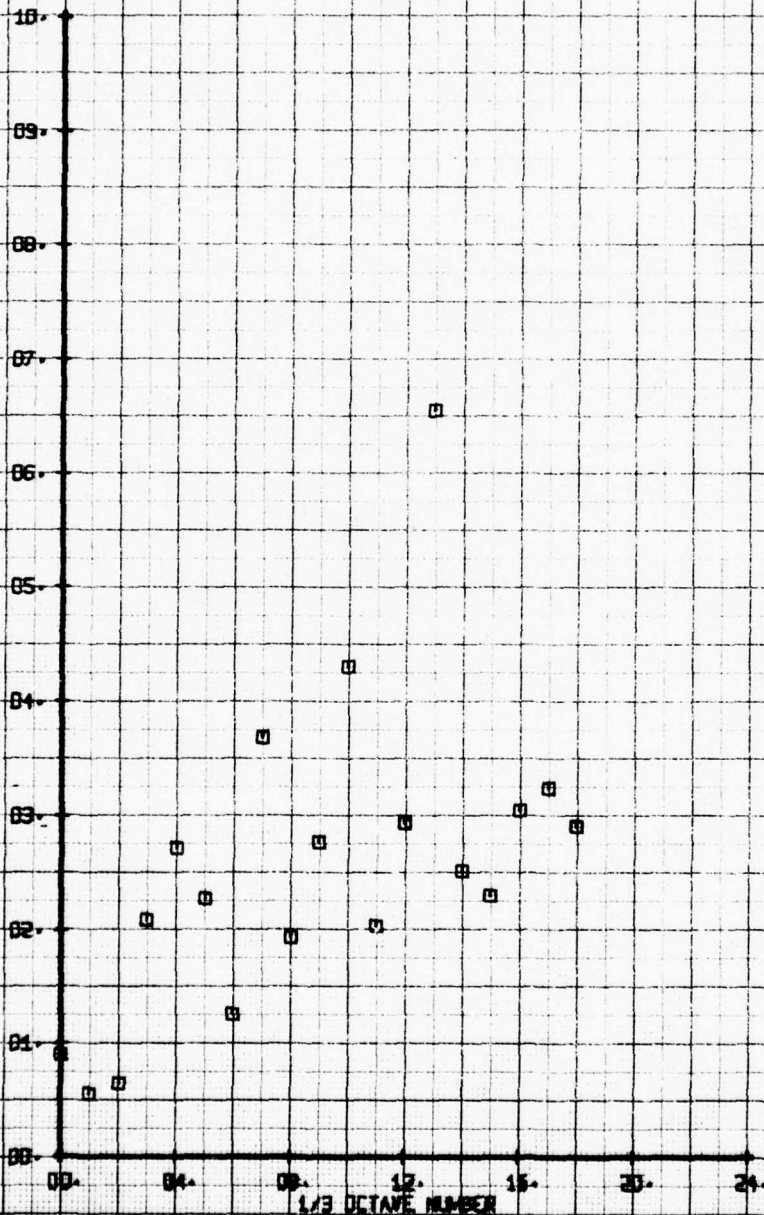
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 5

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS





HOT FILM WAKE 1/3 OCTAVE ANALYSIS

MISC. HUB CVRS 160 FAIRING

RUN 151 TP 6

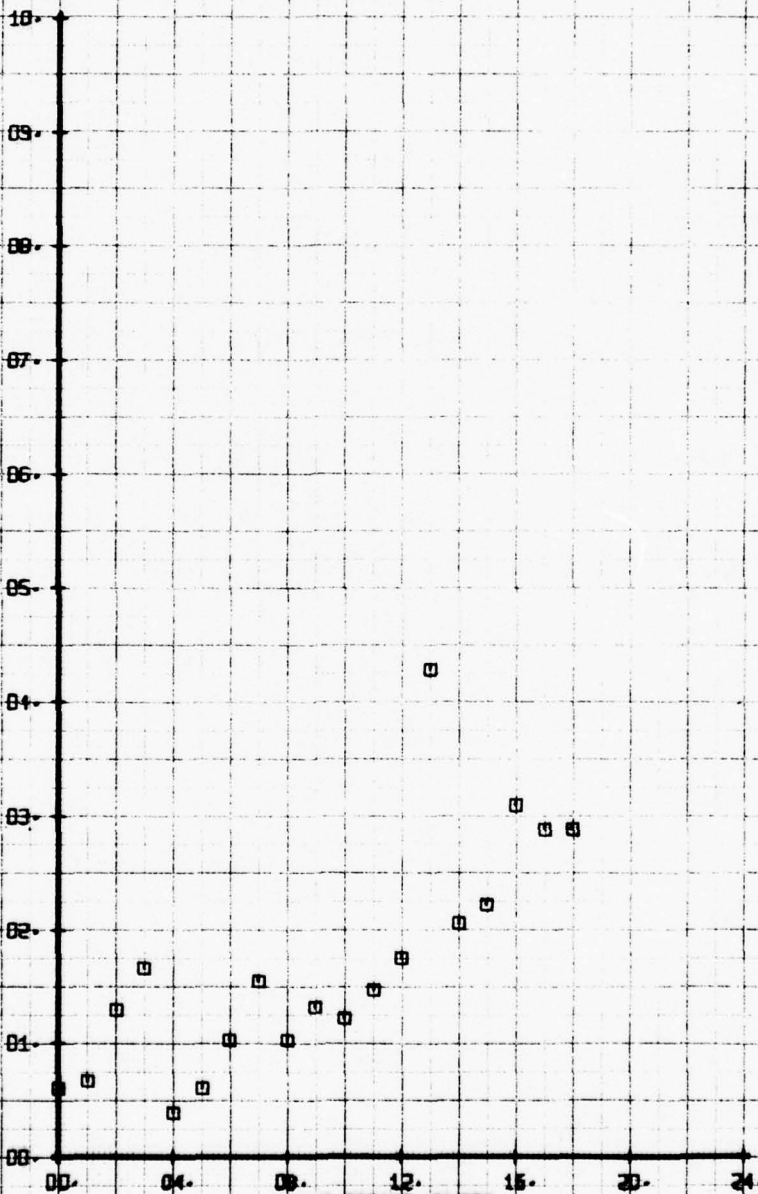
SYM  
□

CH  
65

LEGEND  
PARAMETER  
V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS

1/3 OCTAVE NUMBER



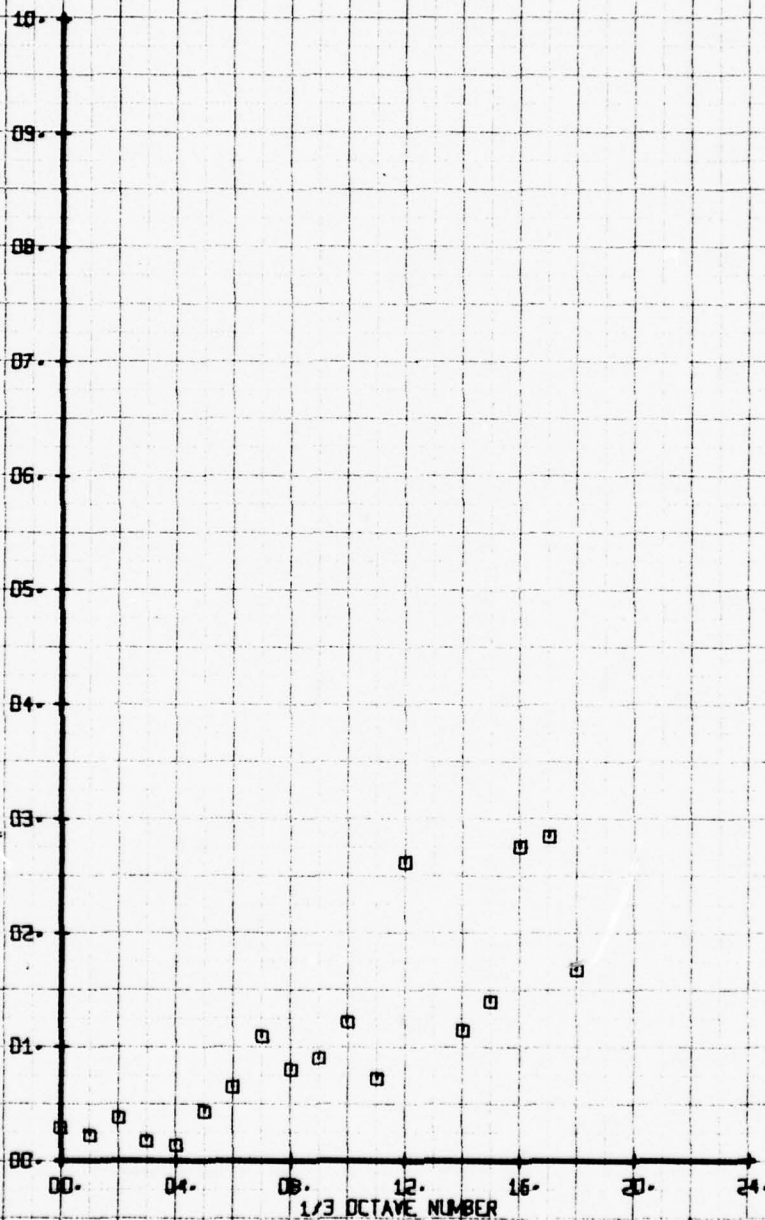
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS 180 FAIRING  
RUN 151 TP 7

SYM  
□

CH  
65

LEGEND  
PARAMETER  
V-BETA

X-2 VELOCITY COMPONENT V-BETA FRS



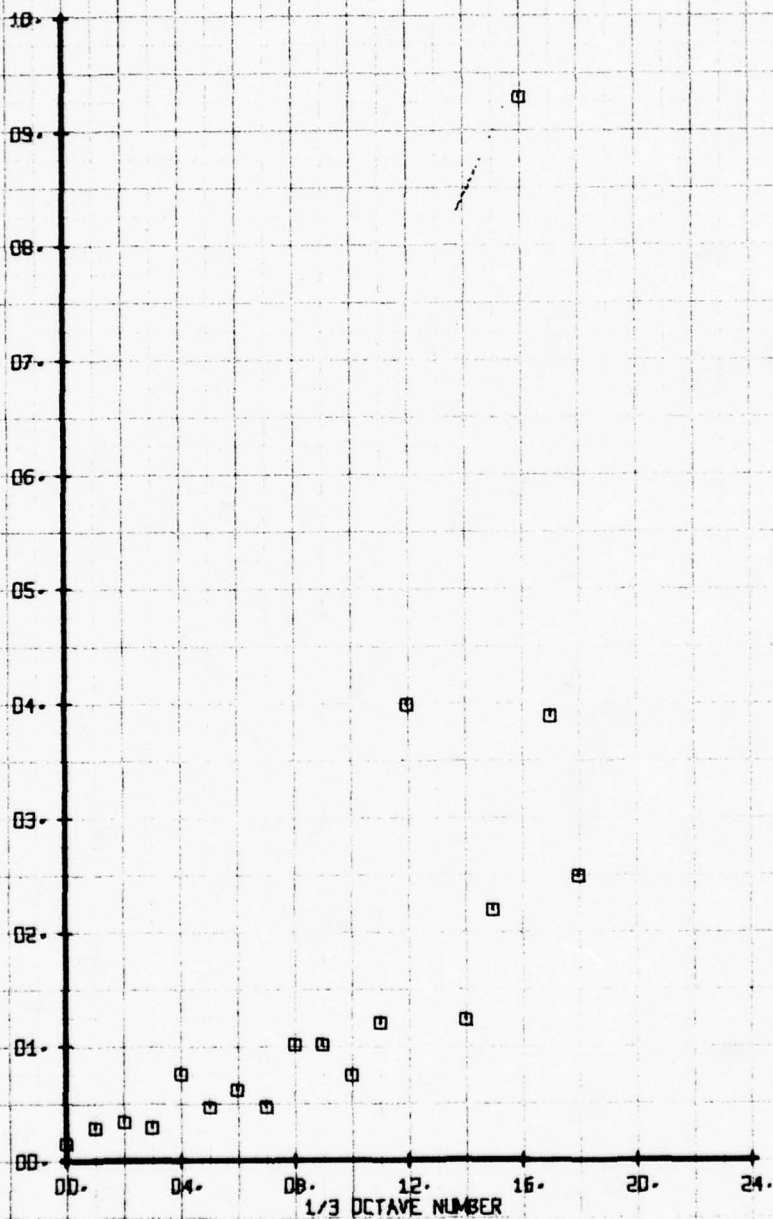
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FATHING  
 RUN 151 TP B

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



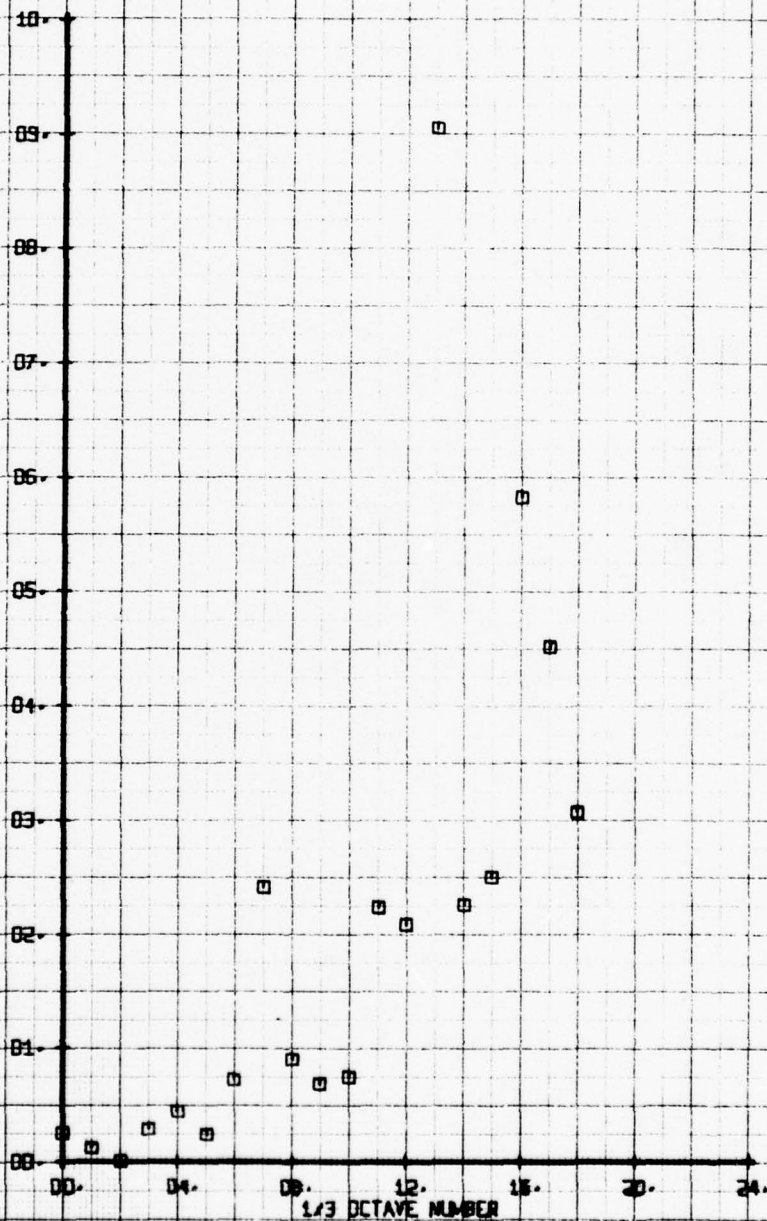
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 160 FAIRING  
 RUN 151 TP 9

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-Z VELOCITY COMPONENT V-BETA EPS



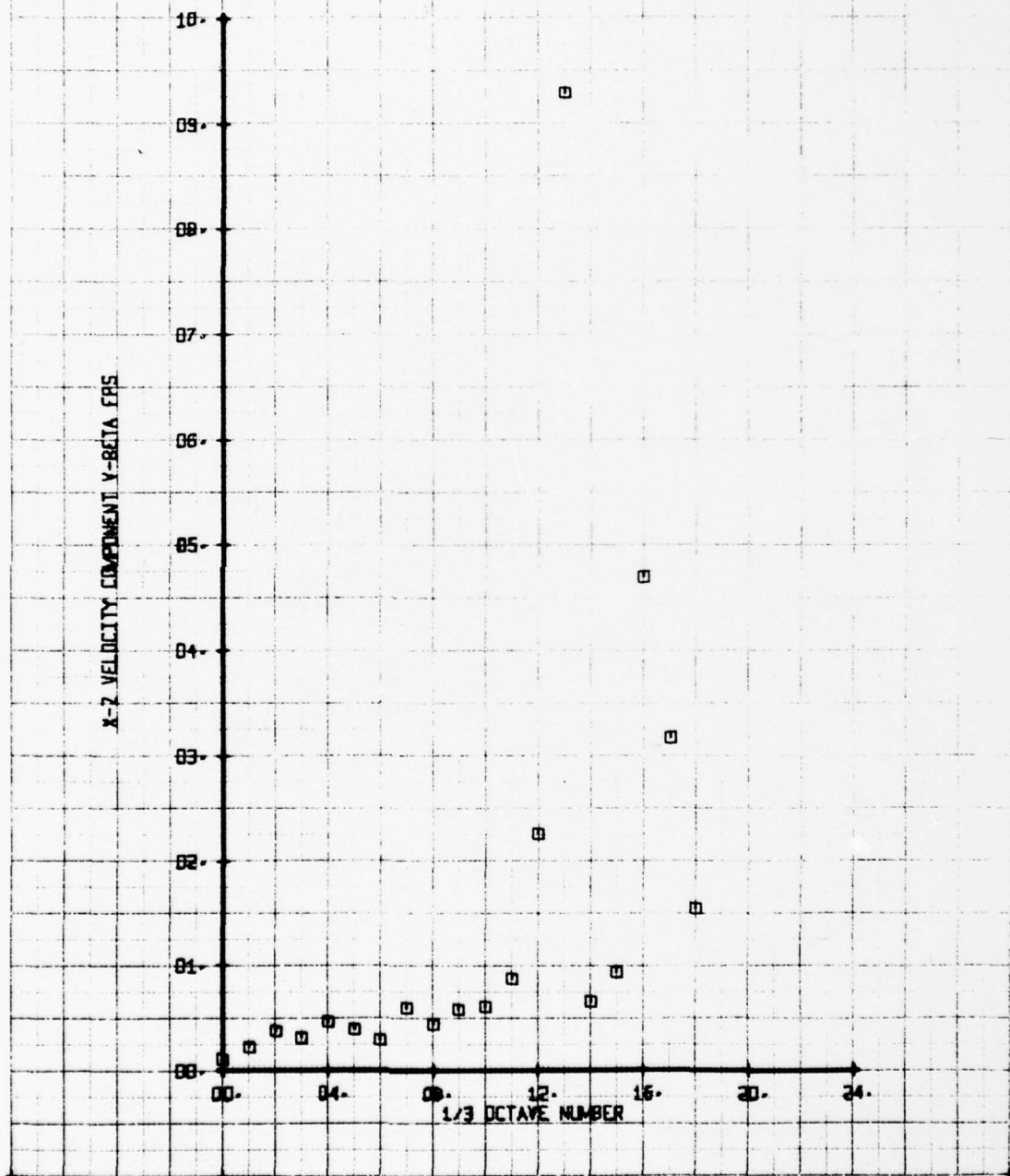


NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS 180 FAIRING  
 RUN 191 TP 10

SYM  
 □

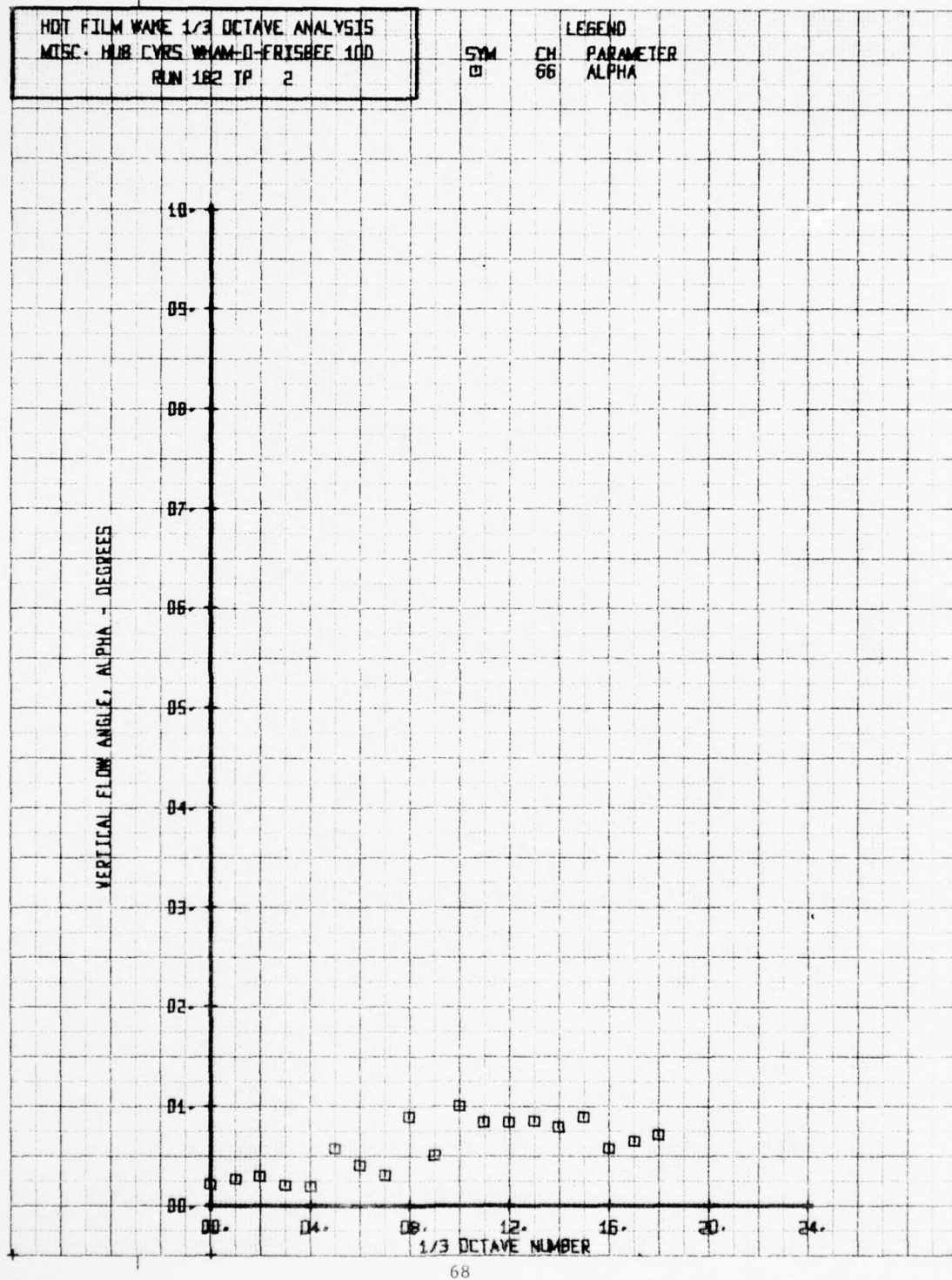
CH  
 65

LEGEND  
 PARAMETER  
 V-BETA



HDT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS WHAM-O-FRISBEE 100  
RUN 182 TP 2

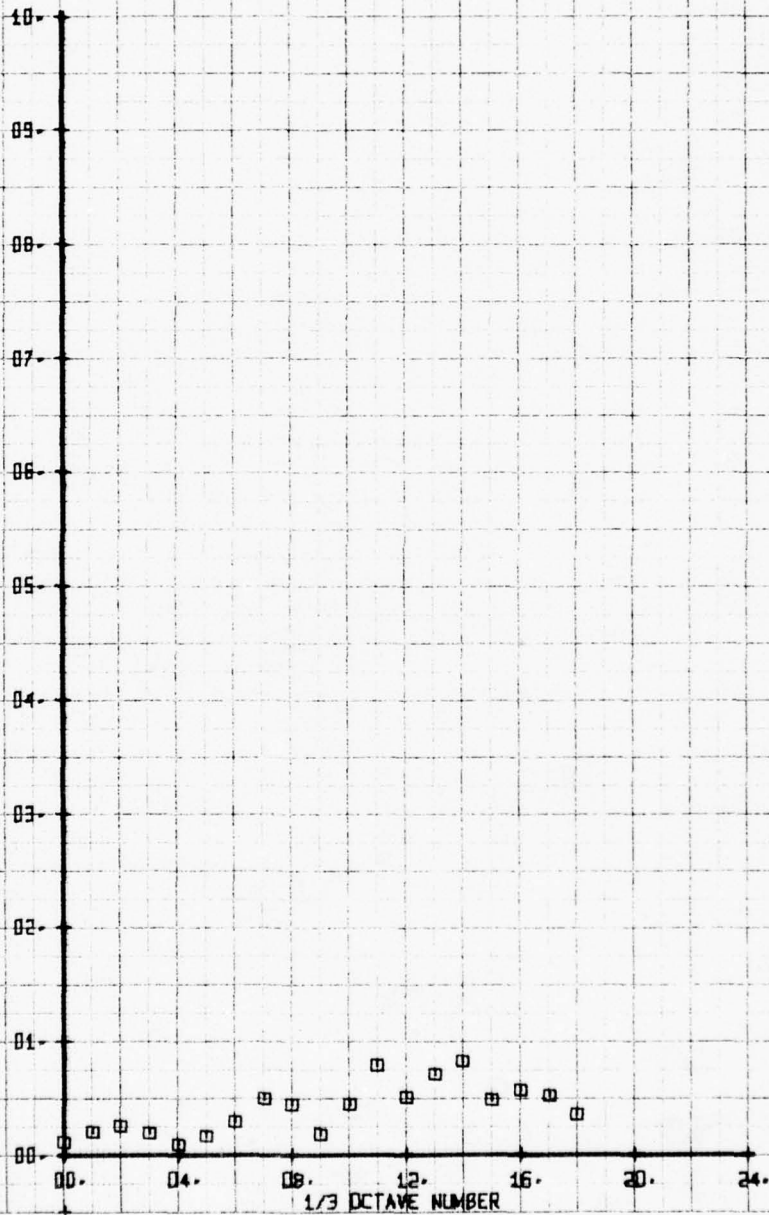
SYM	CH	PARAMETER
□	66	ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CWS WHAM-O-FRISBEE 100  
RUN 182 TP 3

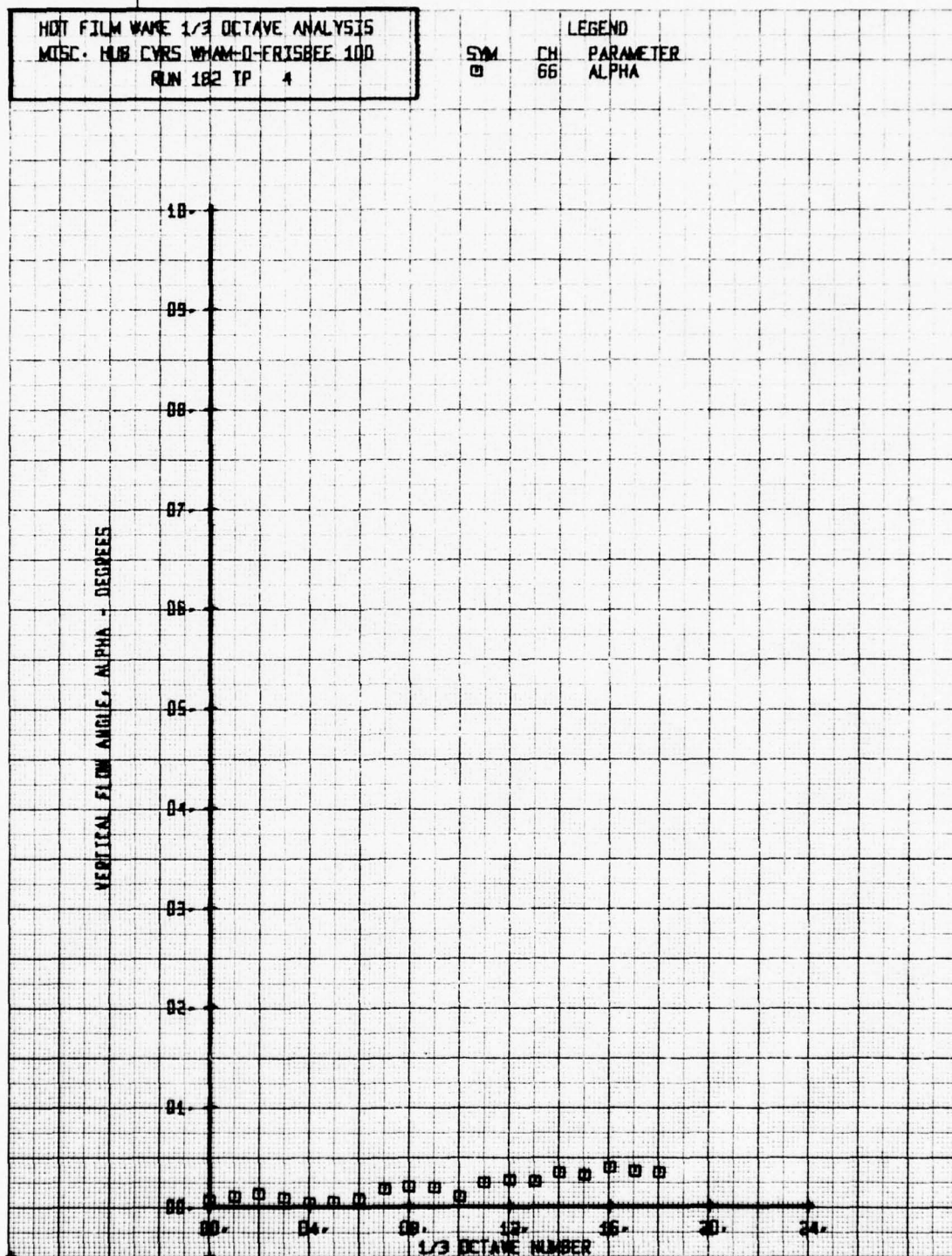
SYM	CH	PARAMETER
□	66	ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



HDT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WHAM-D-FRISBEE 100  
 RUN 182 TP 4

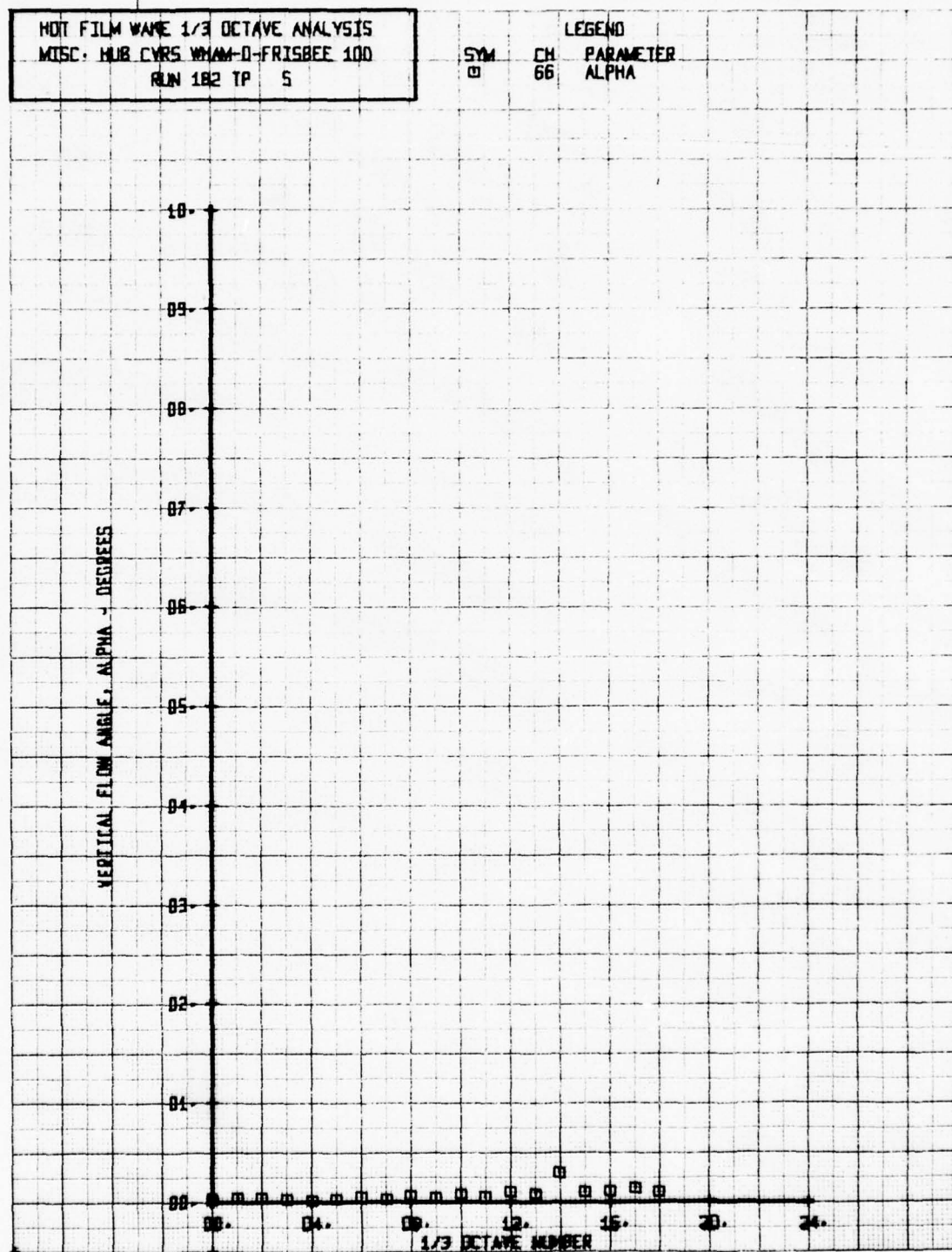
LEGEND  
 CH 66  
 PARAMETER  
 ALPHA





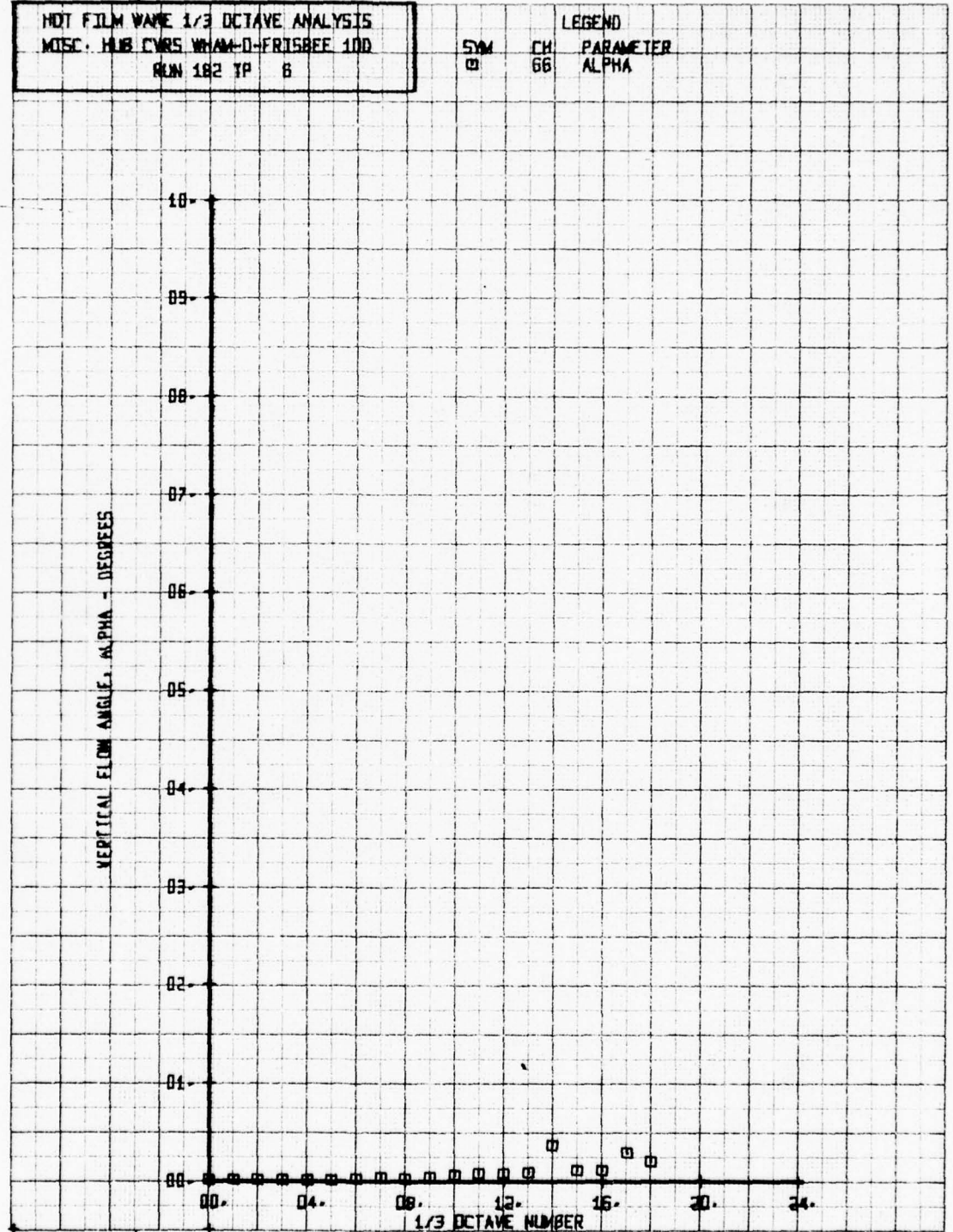
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WHAM-D-FRISBEE 100  
 RUN 182 TP 5

LEGEND	
SYM	CH
□	66
	PARAMETER
	ALPHA



HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WHAM-D-FRISBEE 100  
 RUN 182 TP 8

LEGEND		
SYM	CH	PARAMETER
□	66	ALPHA



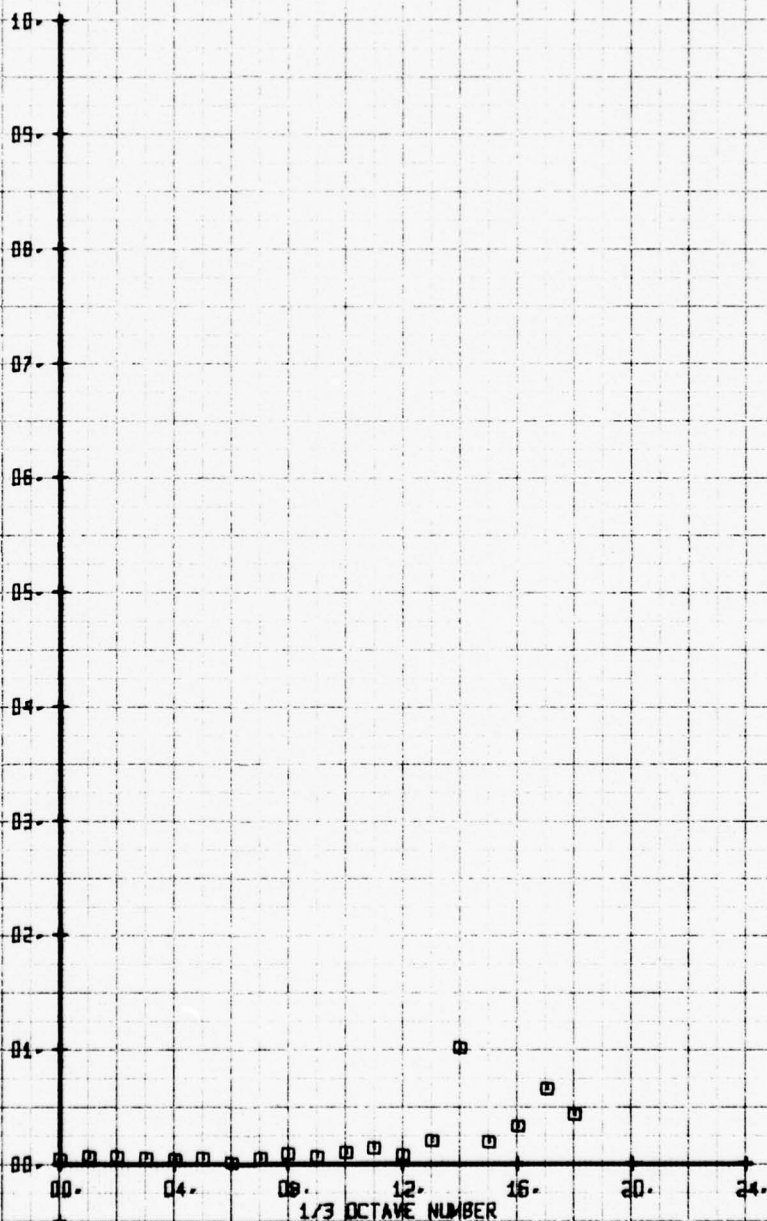
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS WHAM-O-FRISBEE 100  
RUN 182 TP 7

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



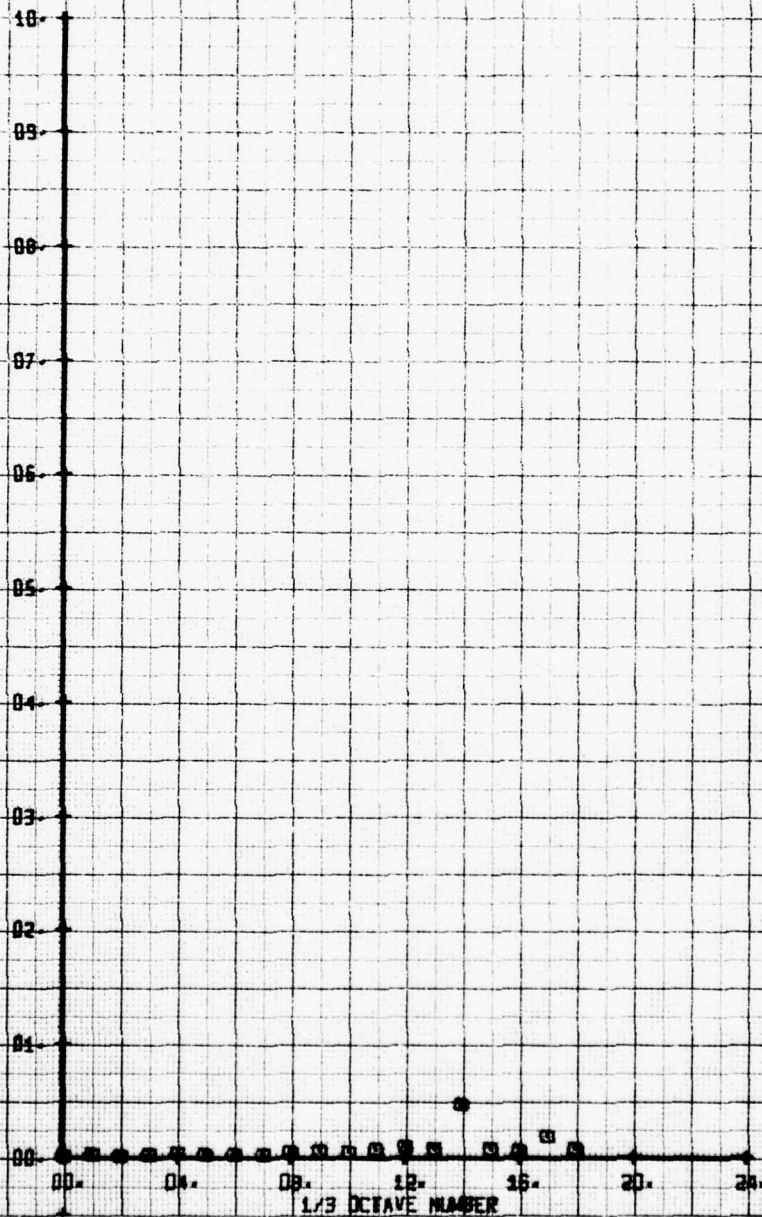
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WHMM-D-FRISBEE 100  
 RUN 1B2 TP 8

SYM  
 0

CH  
 66

LEGEND  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES





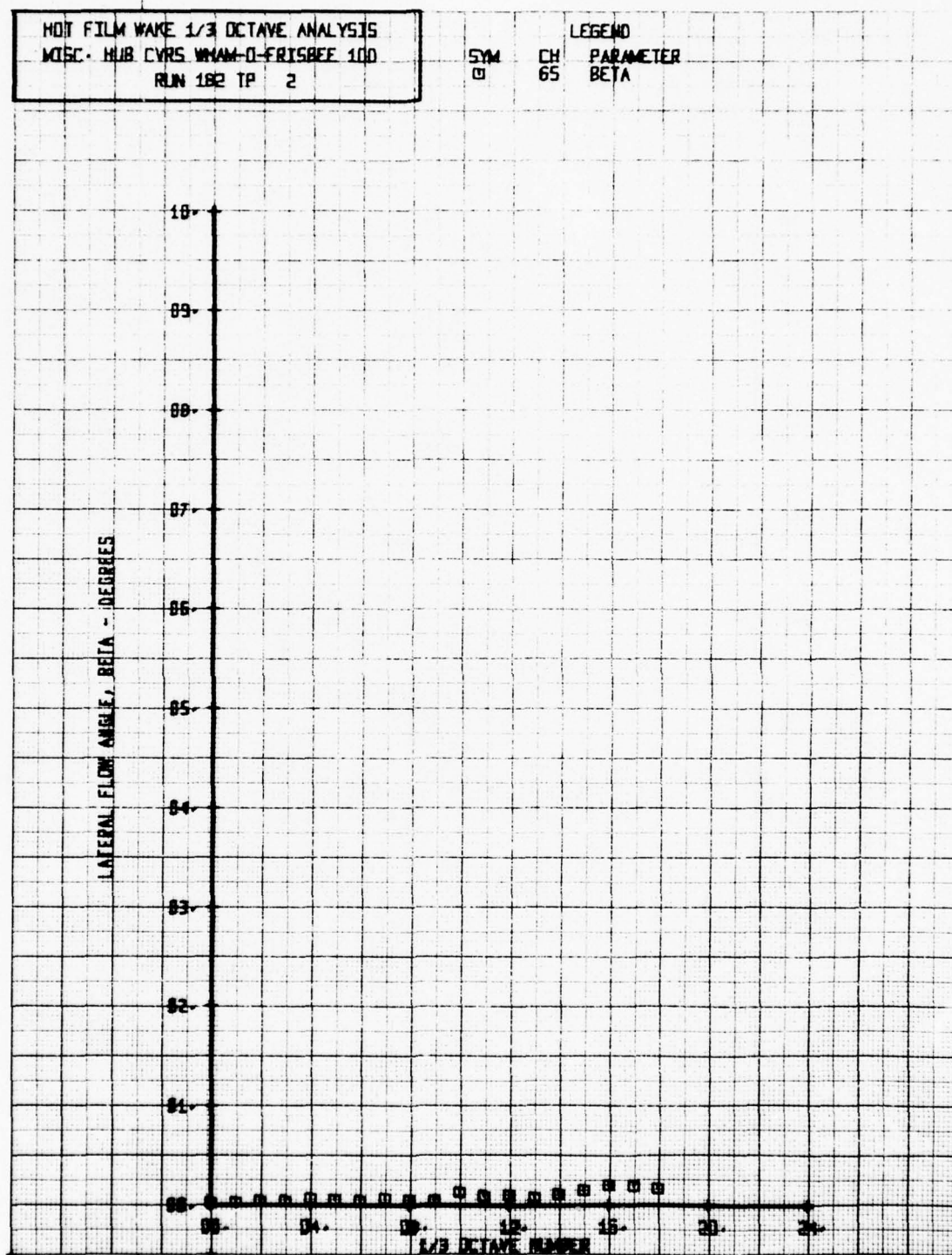
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CVRS WHAM-O-FRISBEE 100  
RUN 182 TP 2

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



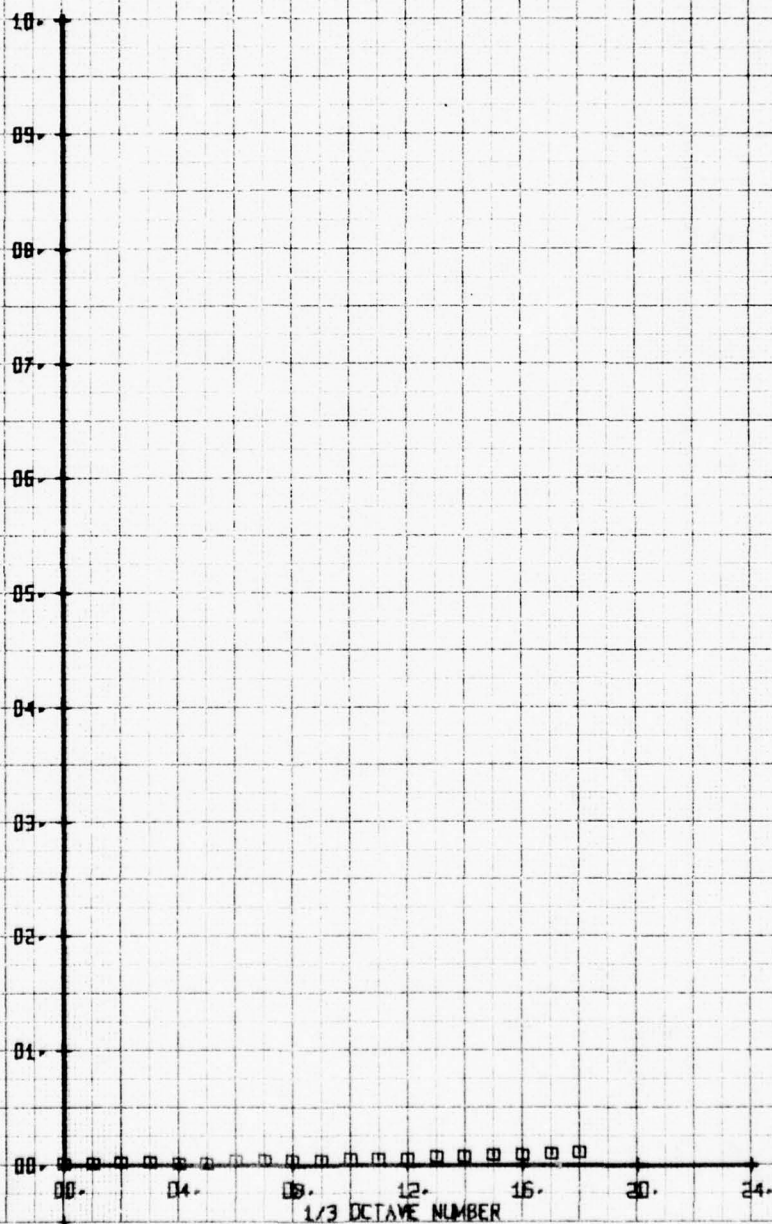
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS WMM-0-FRISBEE 100  
RUN 182 TP 3

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA

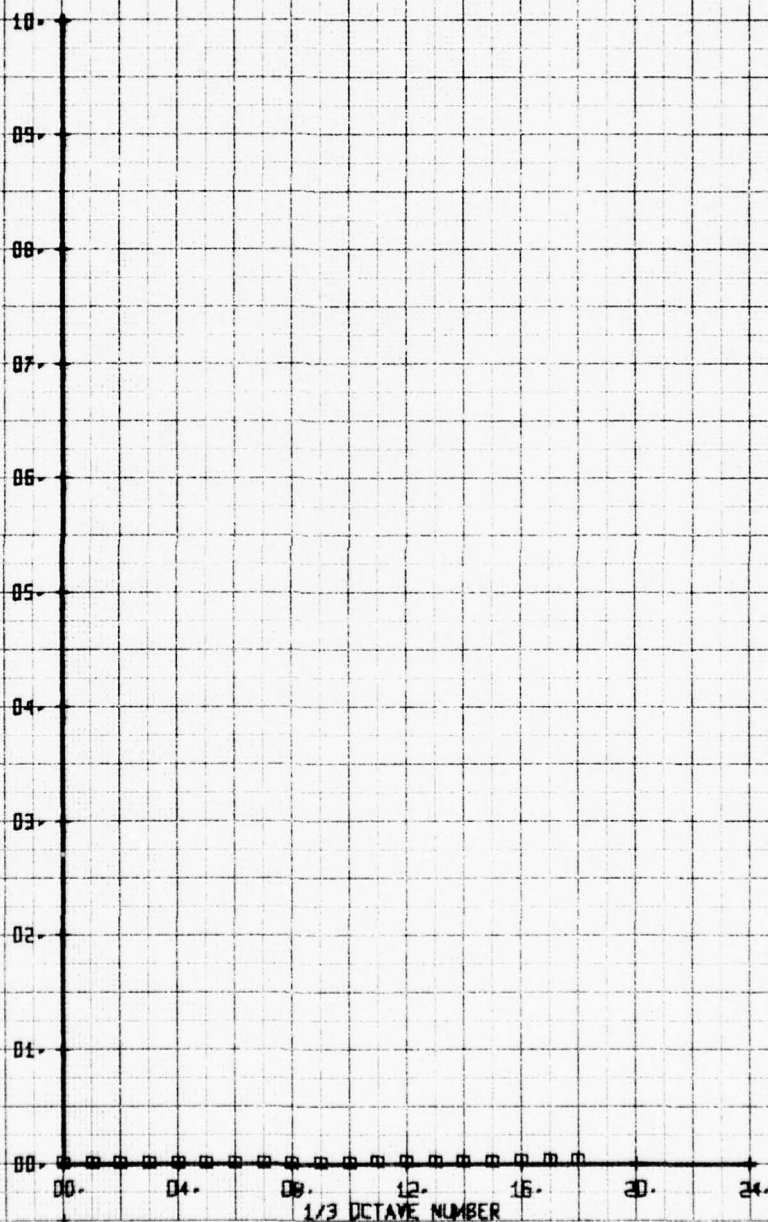
LATERAL FLOW ANGLE, BETA - DEGREES



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CVRS WMM-0-FRISBEE 100  
RUN 182 TP 4

SYM	CH	PARAMETER
0	65	BETA

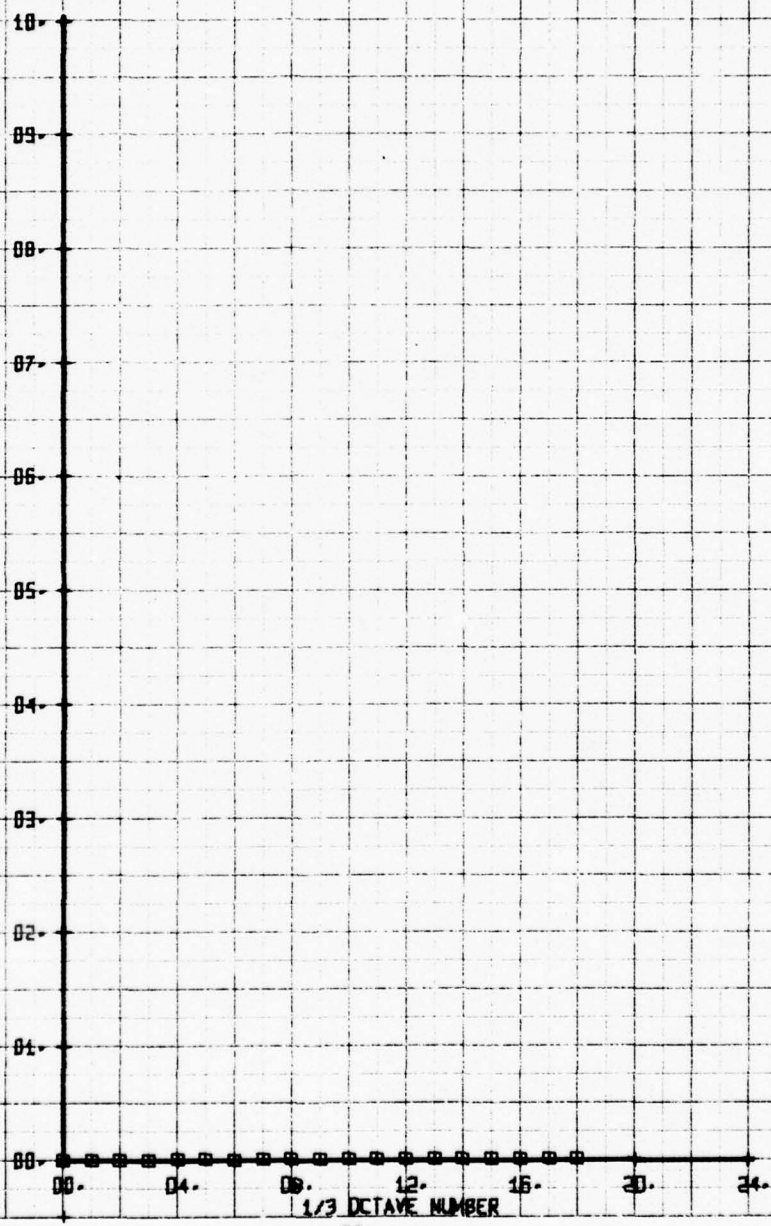
LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CURS W/AM-0-FRISBEF 100  
 RUN 182 TP 5

LEGEND	
SYM	CH
□	65
PARAMETER	
BETA	

LATERAL FLOW ANGLE, BETA - DEGREES





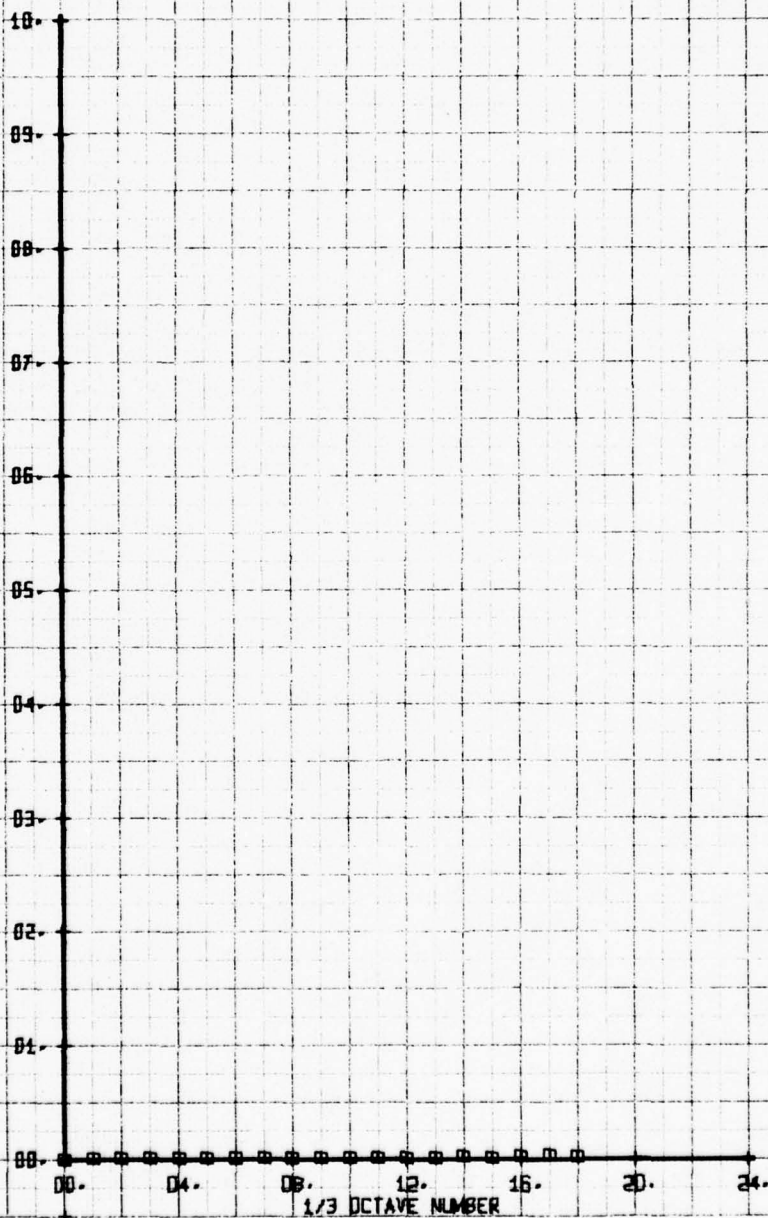
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS WHAM-0-FRISBEE 100  
RUN 182 TP 6

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



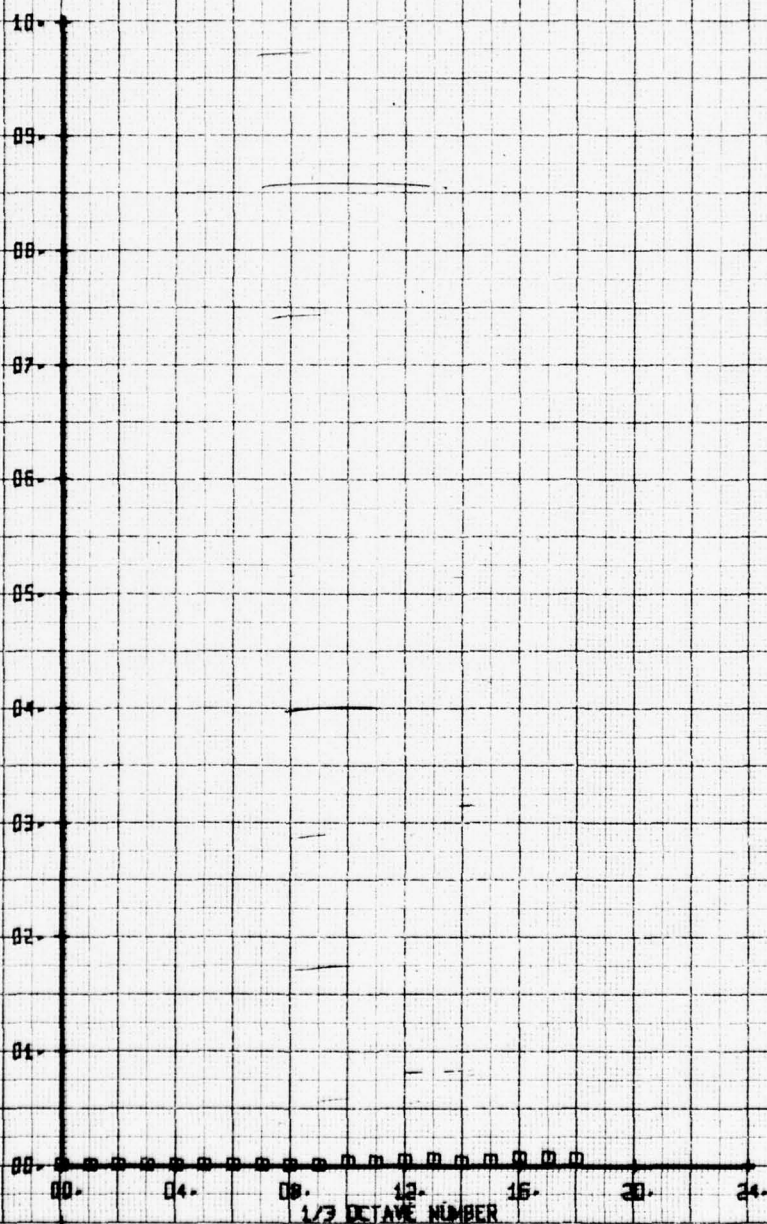
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. MUG CYR5 WHAM-0-FRISBEF 100  
RUN 182 TP 7

SYM  
0

CH  
65

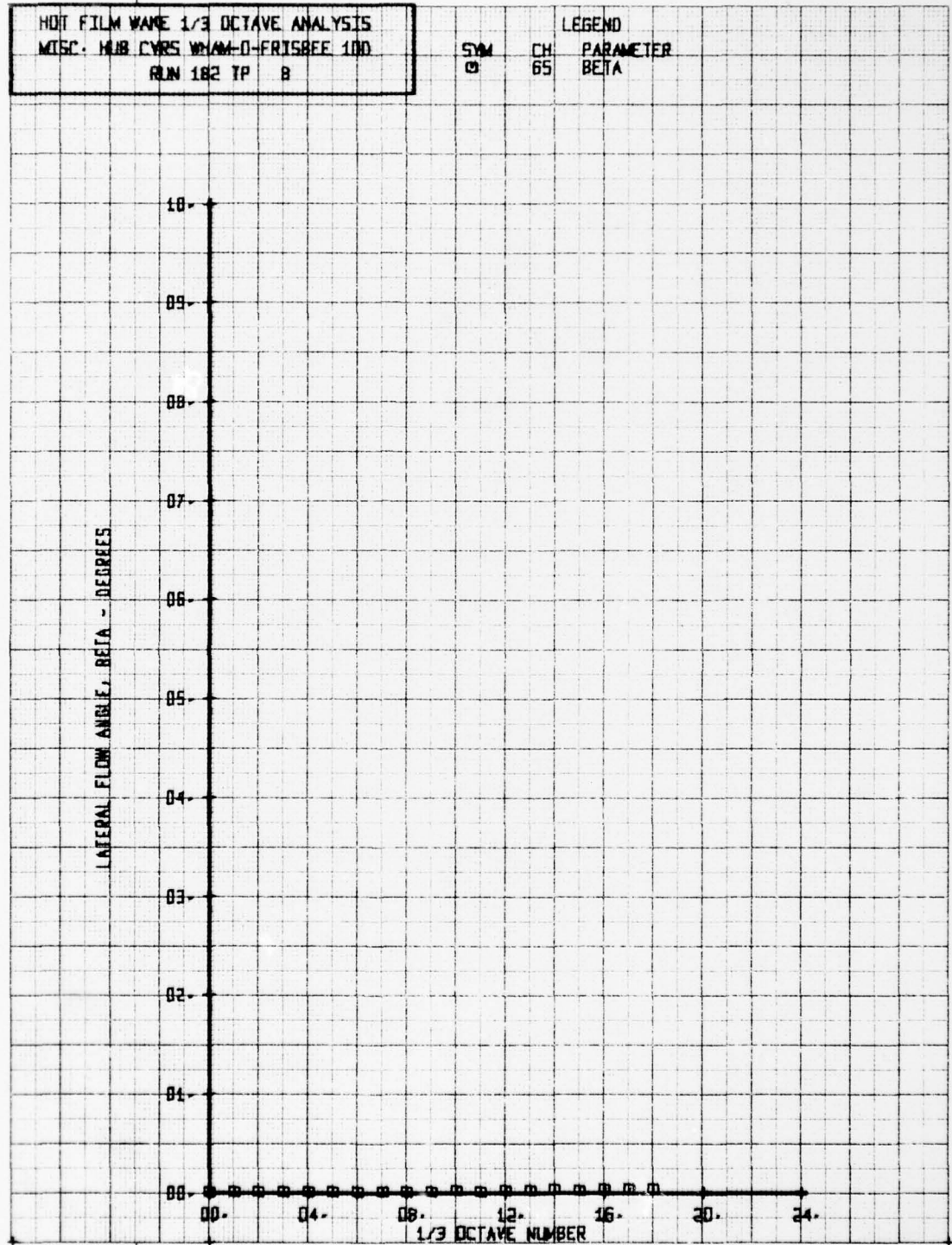
LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS WHAM-D-FRISBEE 100  
RUN 182 TP 8

LEGEND		
SYM	CH	PARAMETER
0	65	BETA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS WMM-0-ERTSREF 100  
 RUN 182 TP 2

SYM  
 0

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS

18  
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1/3 OCTAVE NUMBER

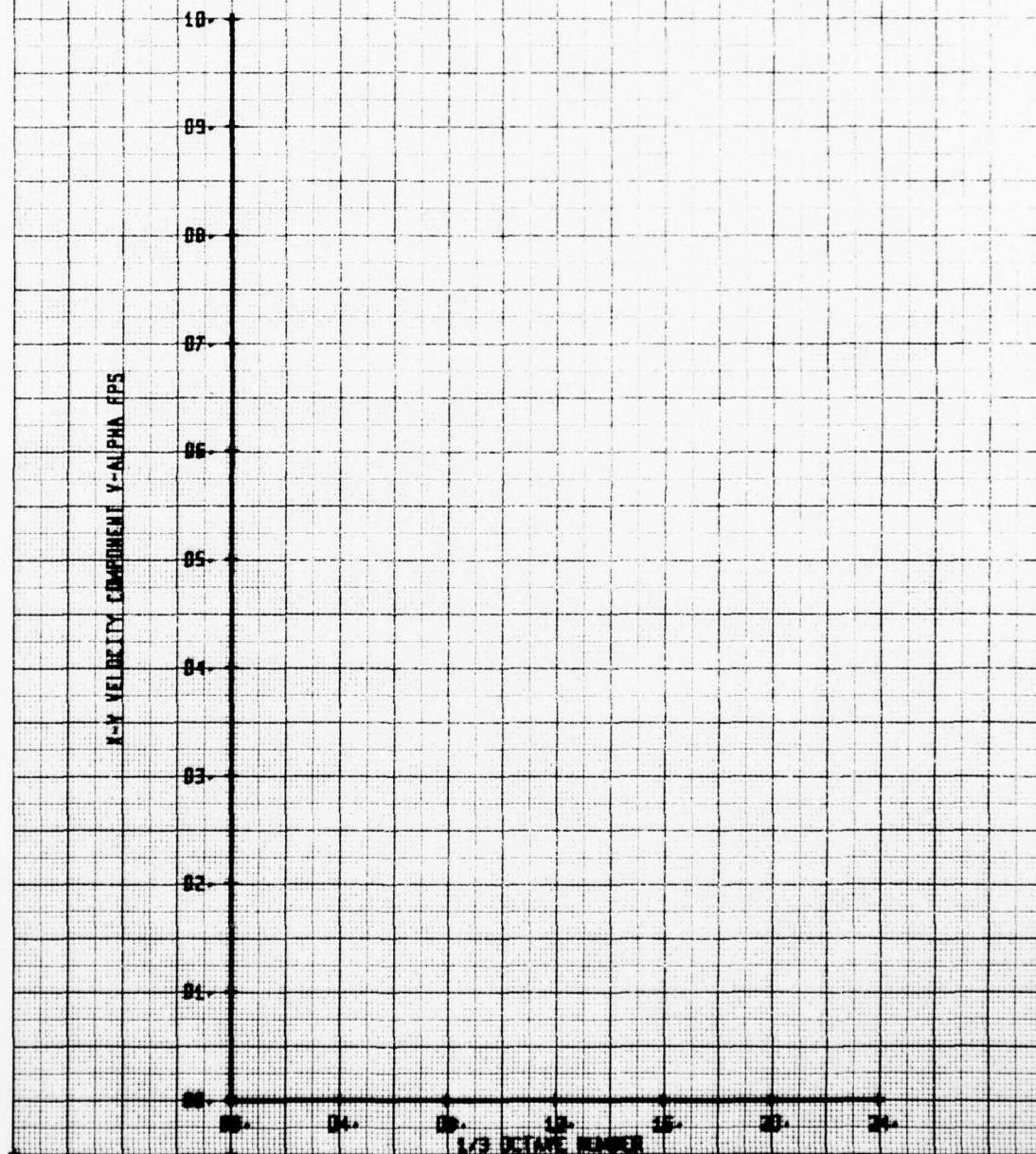


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WHAM-D-FRISBEE 100  
 RUN 182 TP 3

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
MISC. HUB CVRS WHAM-O-FRISBEE 100  
RUN 1B2 TP 4

SYM  
□

CH  
66

LEGEND  
PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS

10.  
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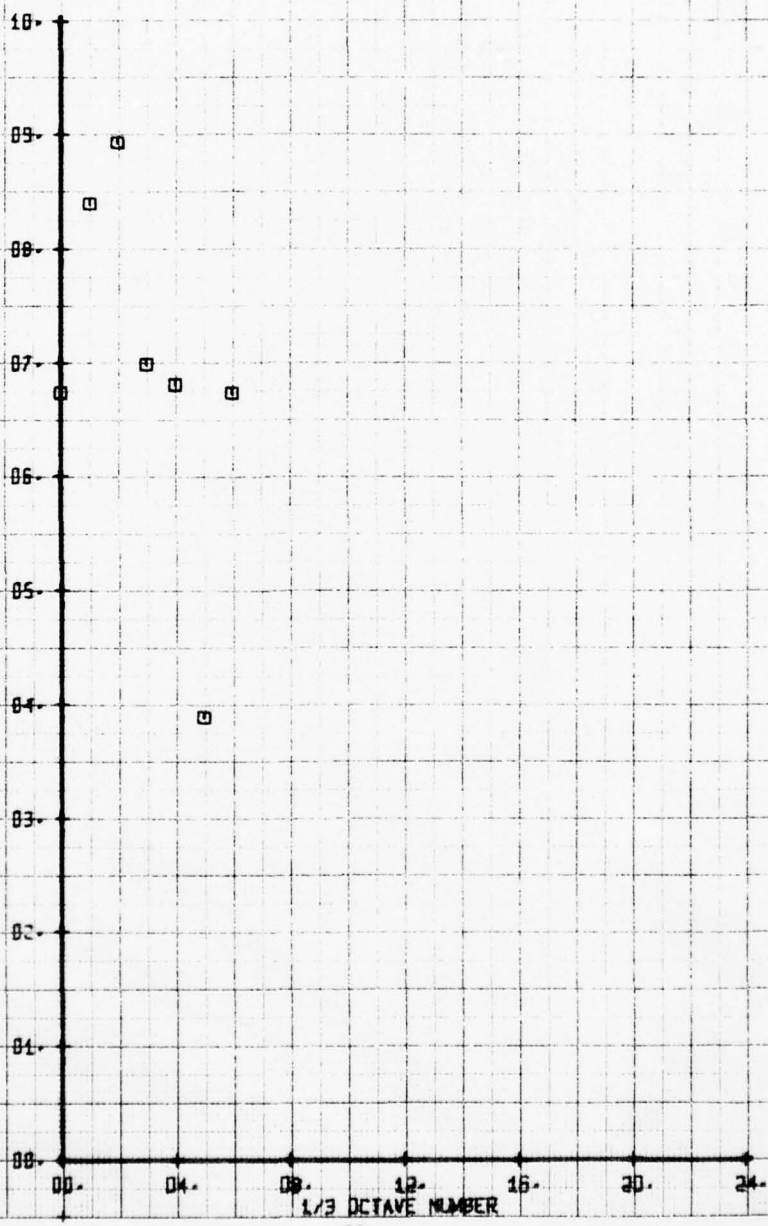
□

1/3 OCTAVE NUMBER

HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS WMM-D-FRISBEE 100  
 RUN 182 TP 5

LEGEND  
 CH 66  
 PARAMETER  
 V-ALPHA

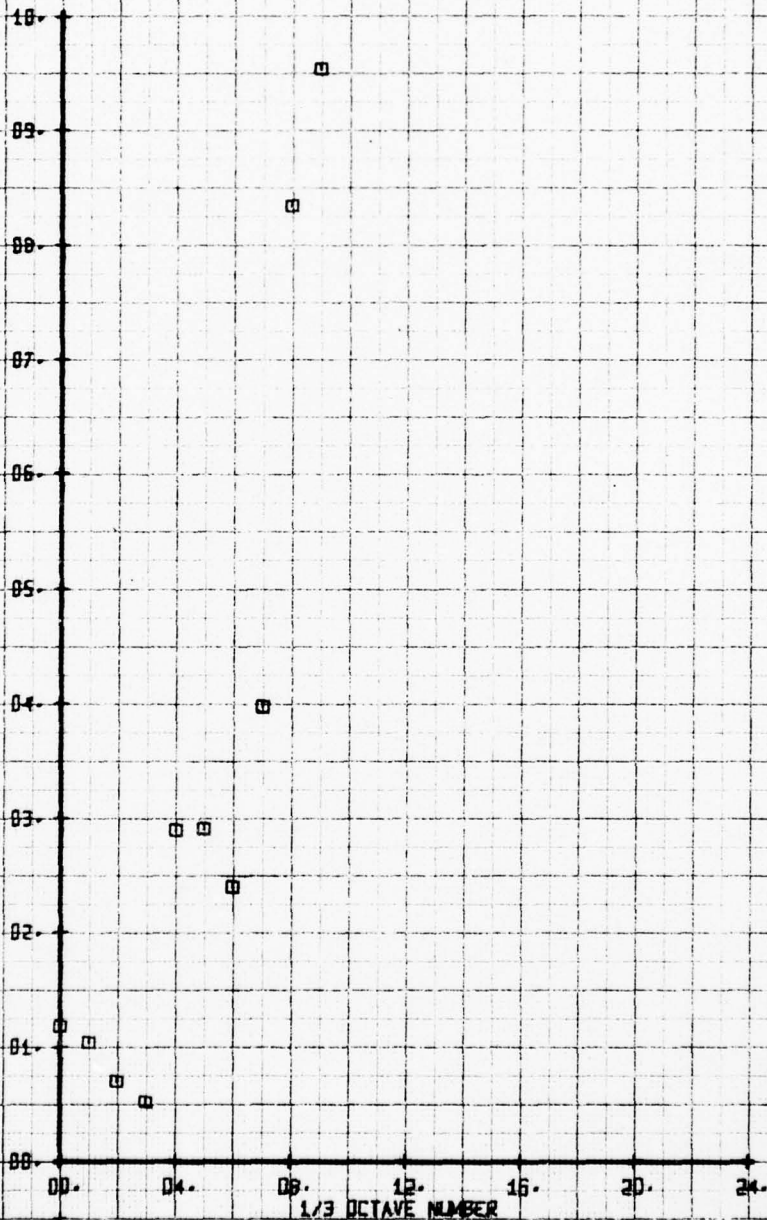
X-Y VELOCITY COMPONENT V-ALPHA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WHAM-O-FRISBEE 100  
 RUN 182 TP 6

LEGEND  
 SYM CH PARAMETER  
 □ 56 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS





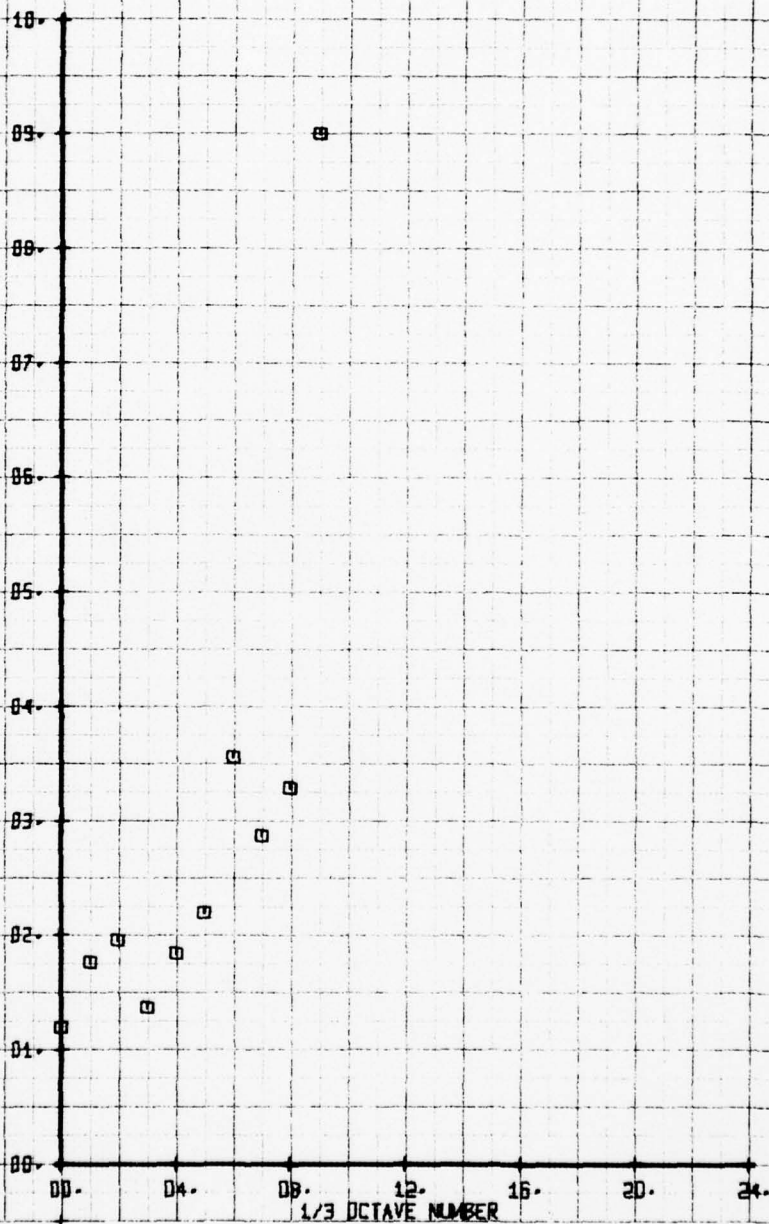
NOY FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC- HUB CVRS WHAM-O-FRISBEF 100  
 RUN 182 TP 7

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



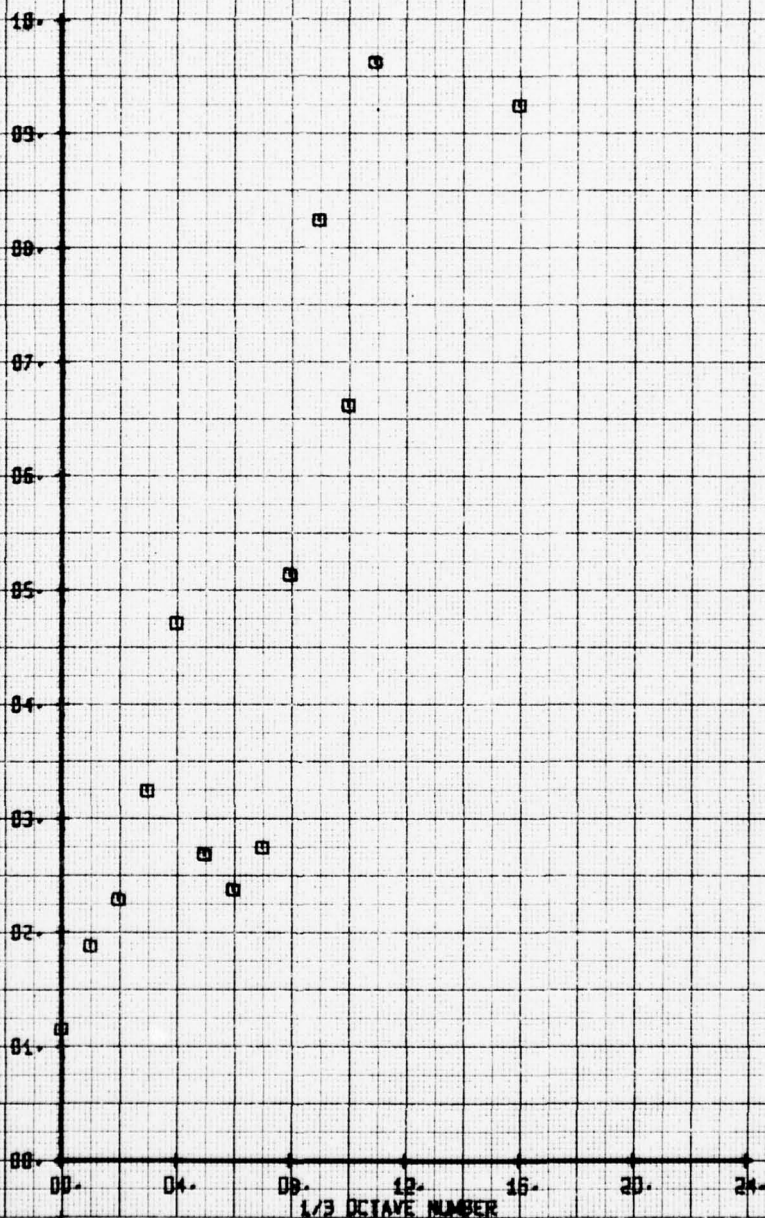
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 WISC - HUB CVRS WMM-D-FRISCH 100  
 RUN 182 TP 8

SYM  
 0

CH  
 55

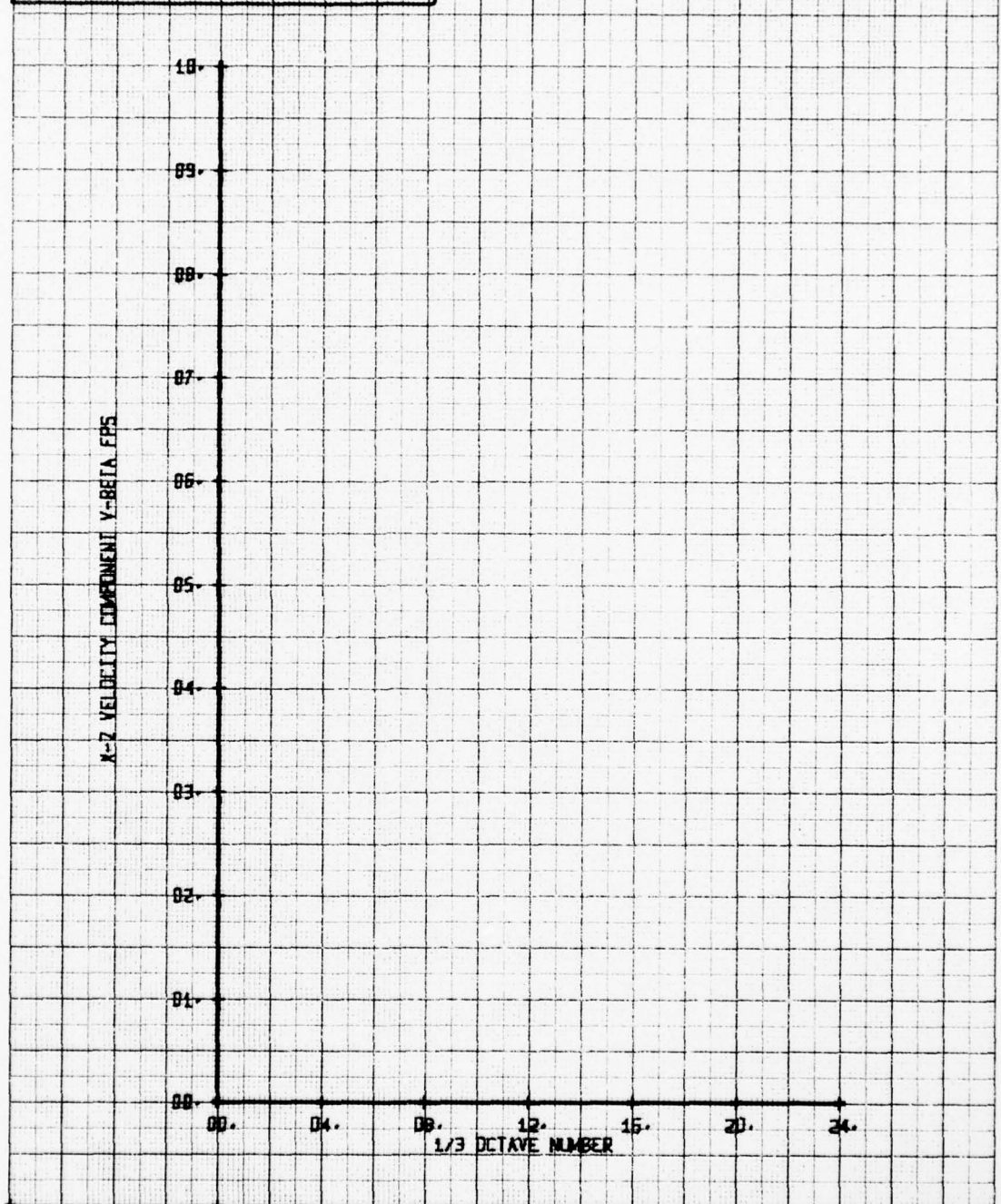
LEGEND  
 PARAMETER  
 V-ALPHA

A-Y VELOCITY COMPONENT V-ALPHA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS WAM-0-FRISBEE 100  
 RUN 182 TP 2

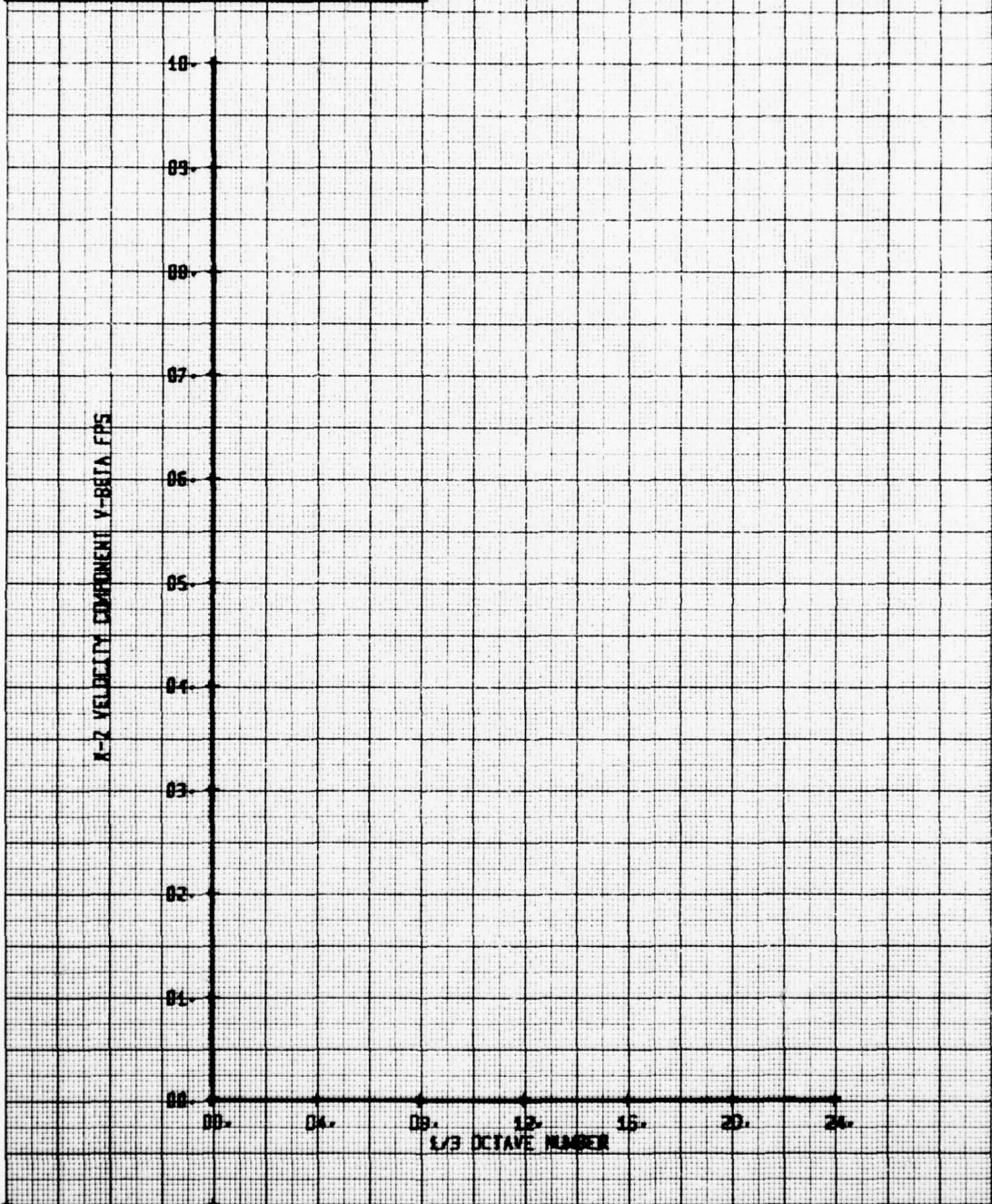
LEGEND	
SYM	CH
0	65
PARAMETER	
V-BETA	





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC - HUB CVRS WHAM-O-FRISSEE 100  
 RUN 182 TP 3

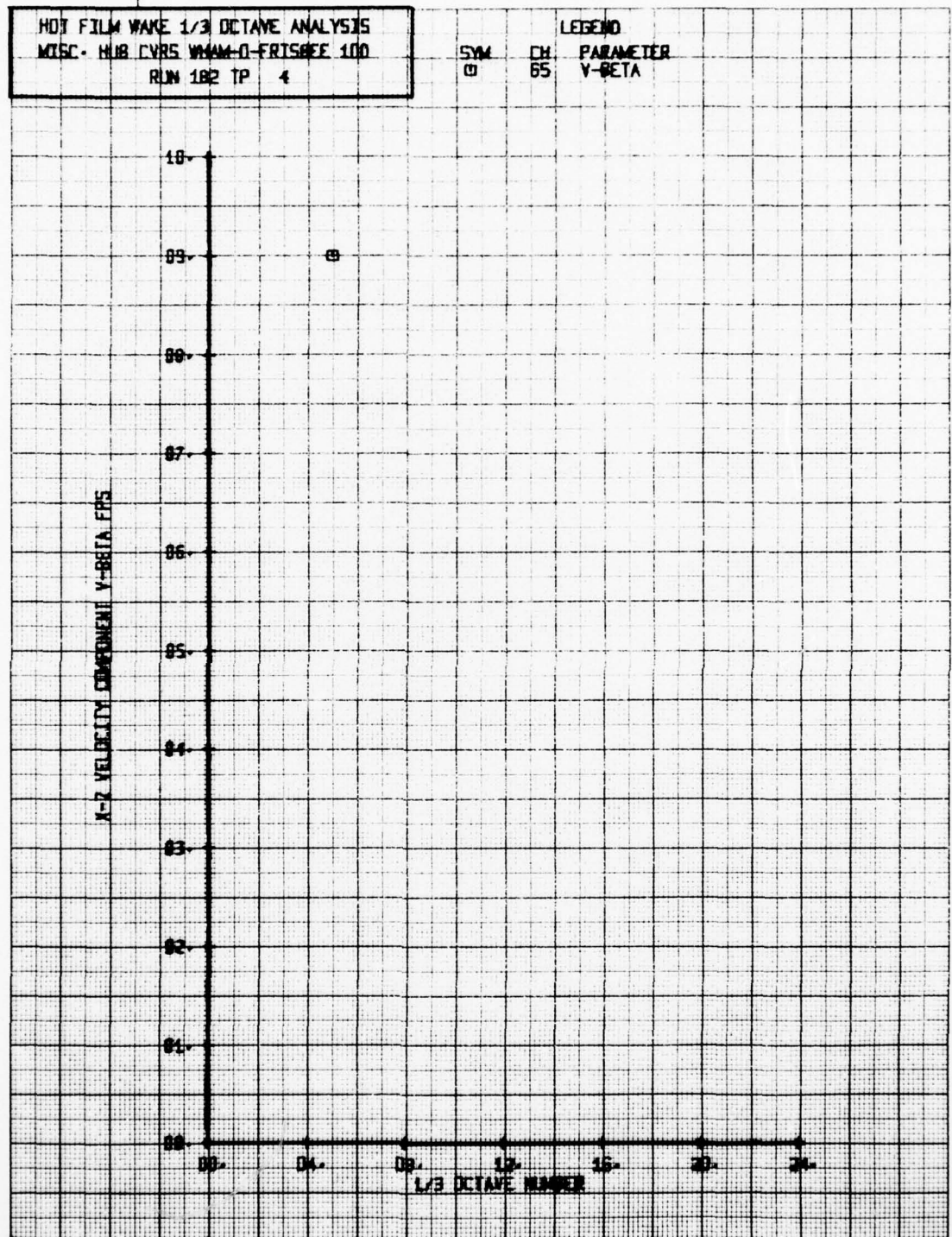
LEGEND	
SYM	PARAMETER
□	V-BETA





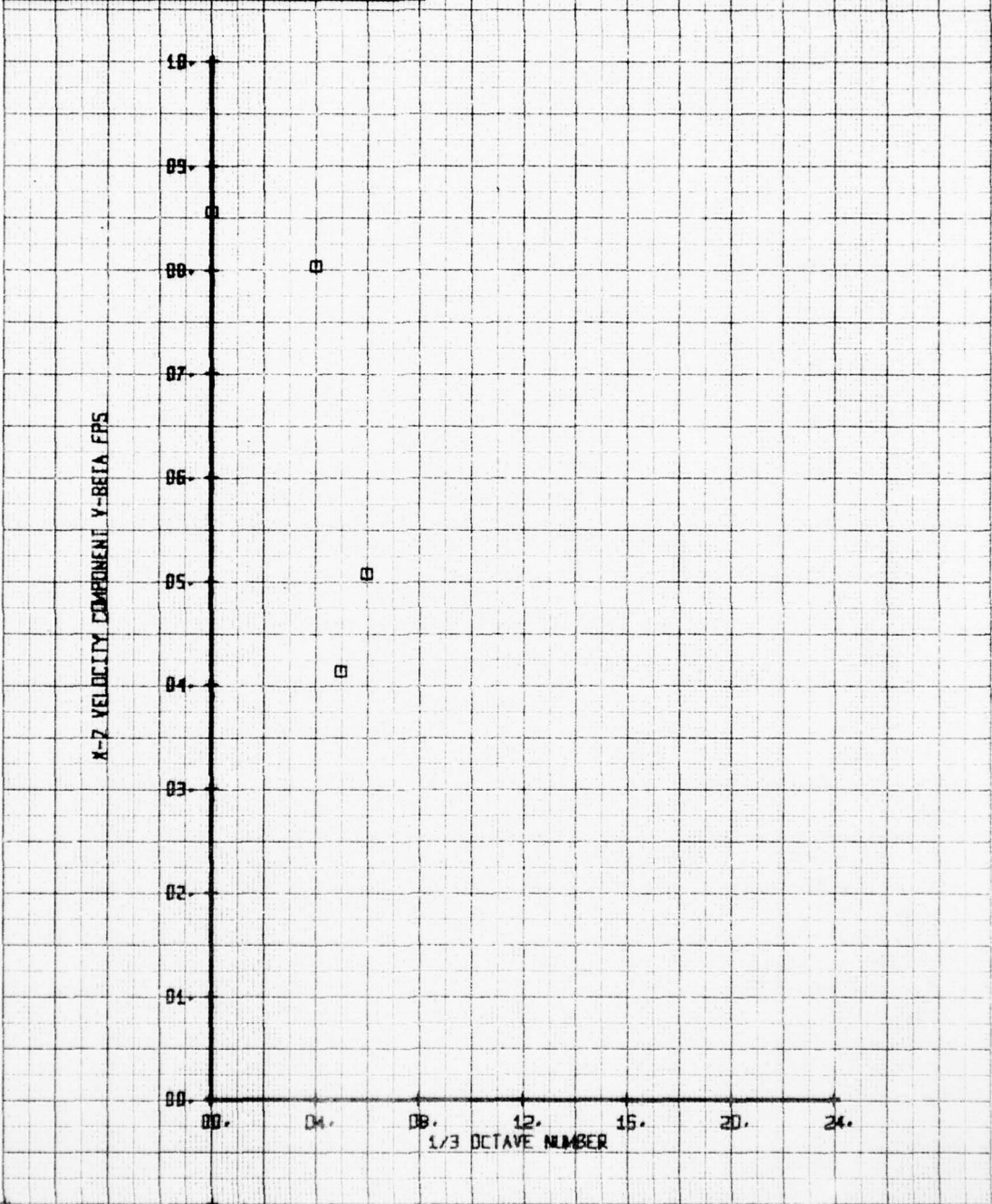
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS WAM-0-ERISSEE 100  
 RUN 182 TP 4

SYM	CH	PARAMETER
0	65	V-BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 WISC. HUB CYRS WHAM-O-FRISBEE 100  
 RUN 182 TP 5

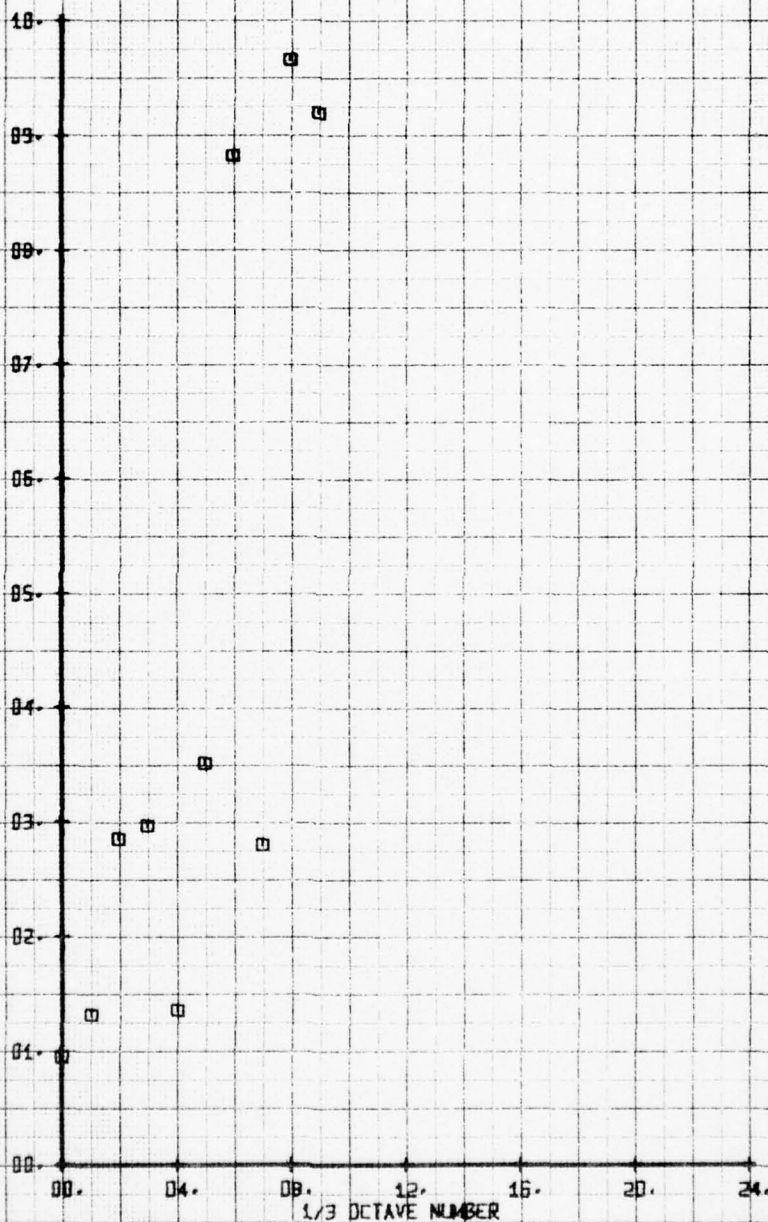
LEGEND	
SYM	CH
□	65
PARAMETER	
V-BETA	



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS WHAM-O-FRISBEE 100  
 RUN 182 TP 6

SYM	CH	PARAMETER
□	65	V-BETA

X-Z VELOCITY COMPONENT V-BETA FPS

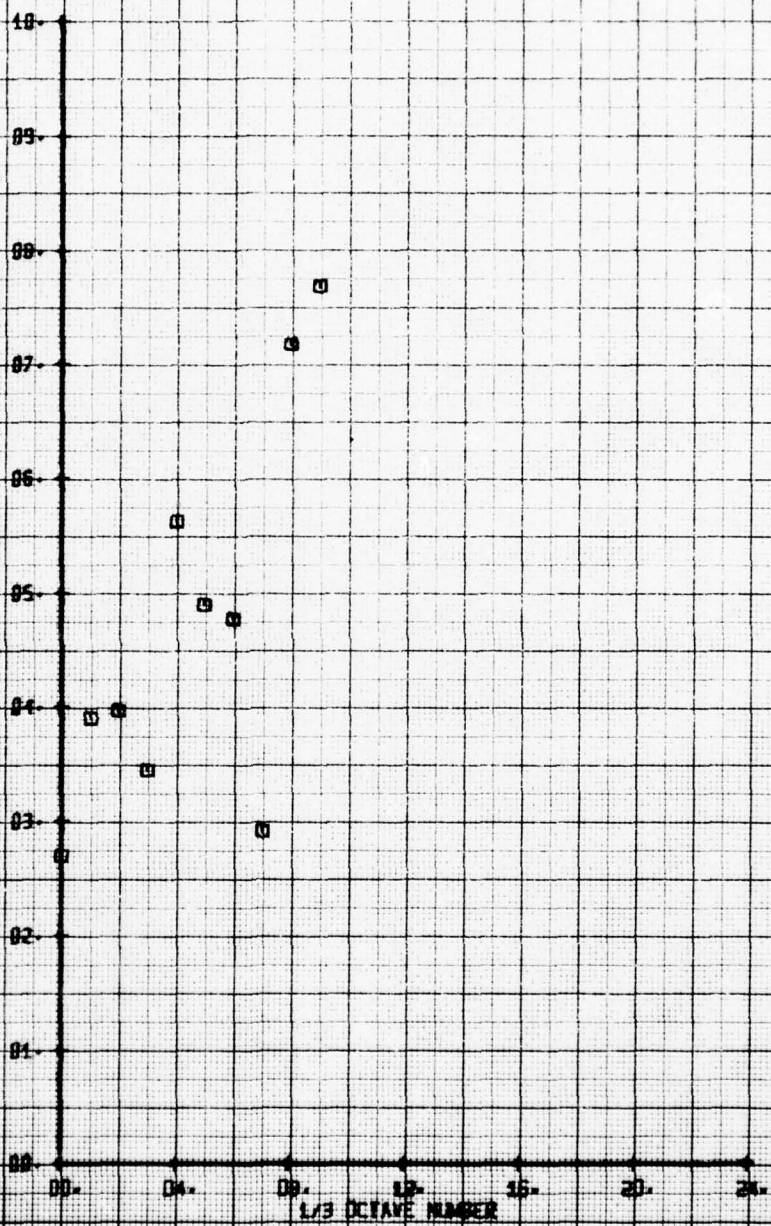




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC - HUB CVRS WMM-D-FRISSEE 100  
 RUN 182 TP 7

SYM	CH	PARAMETER
□	65	V-BETA

K-Z VELOCITY COMPONENT V-BETA FPS





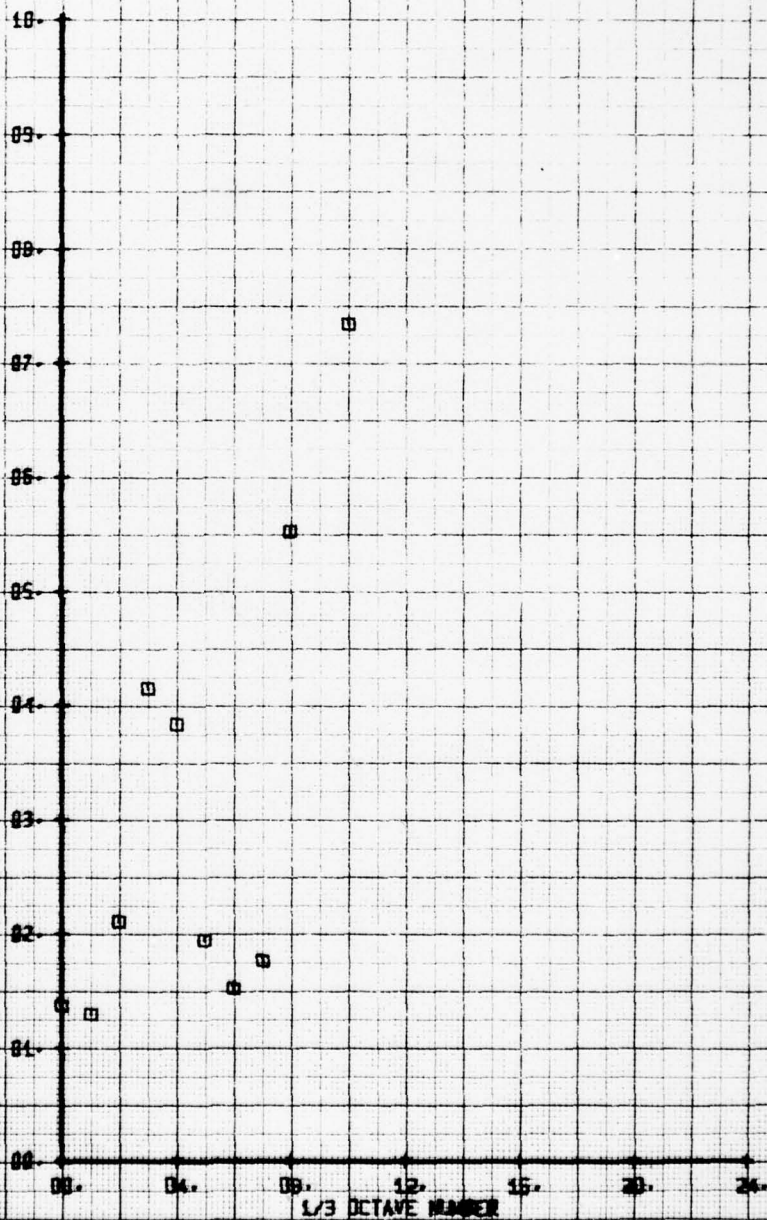
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS WAM-O-FRISBEE 100  
 RUN 182 TP 8

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-Z VELOCITY COMPONENT V-BETA FPS



AD-A063 653

BOEING VERTOL CO PHILADELPHIA PA  
INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONF--ETC(U)  
SEP 78 P F SHERIDAN

F/G 1/3

DAAJ02-77-C-0020

USARTL-TR-78-23D-V4-E

NL

UNCLASSIFIED

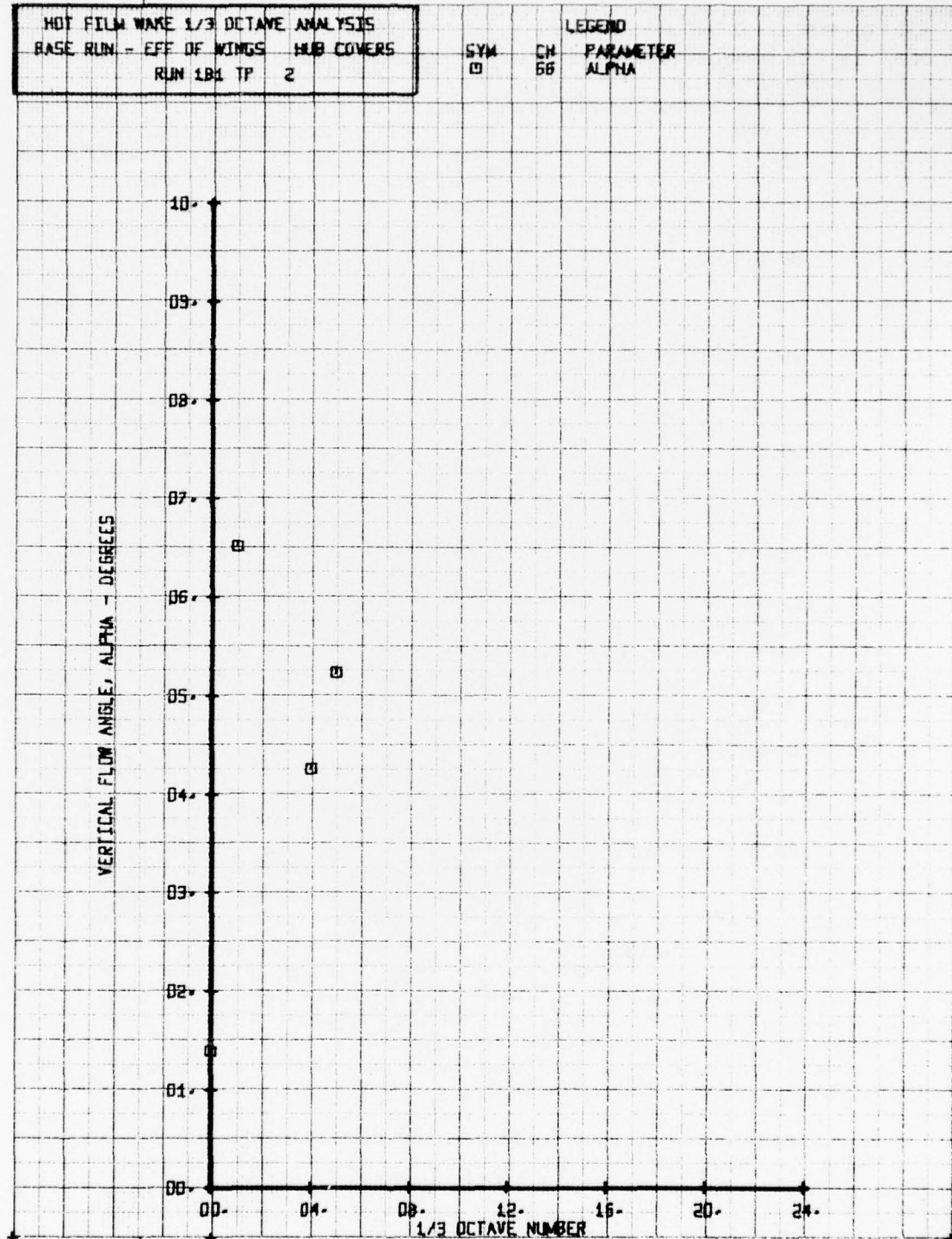
2 OF 4

AD  
A063 653



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 1B1 TP 2

LEGEND  
 SYM CH PARAMETER  
 □ 56 ALPHA

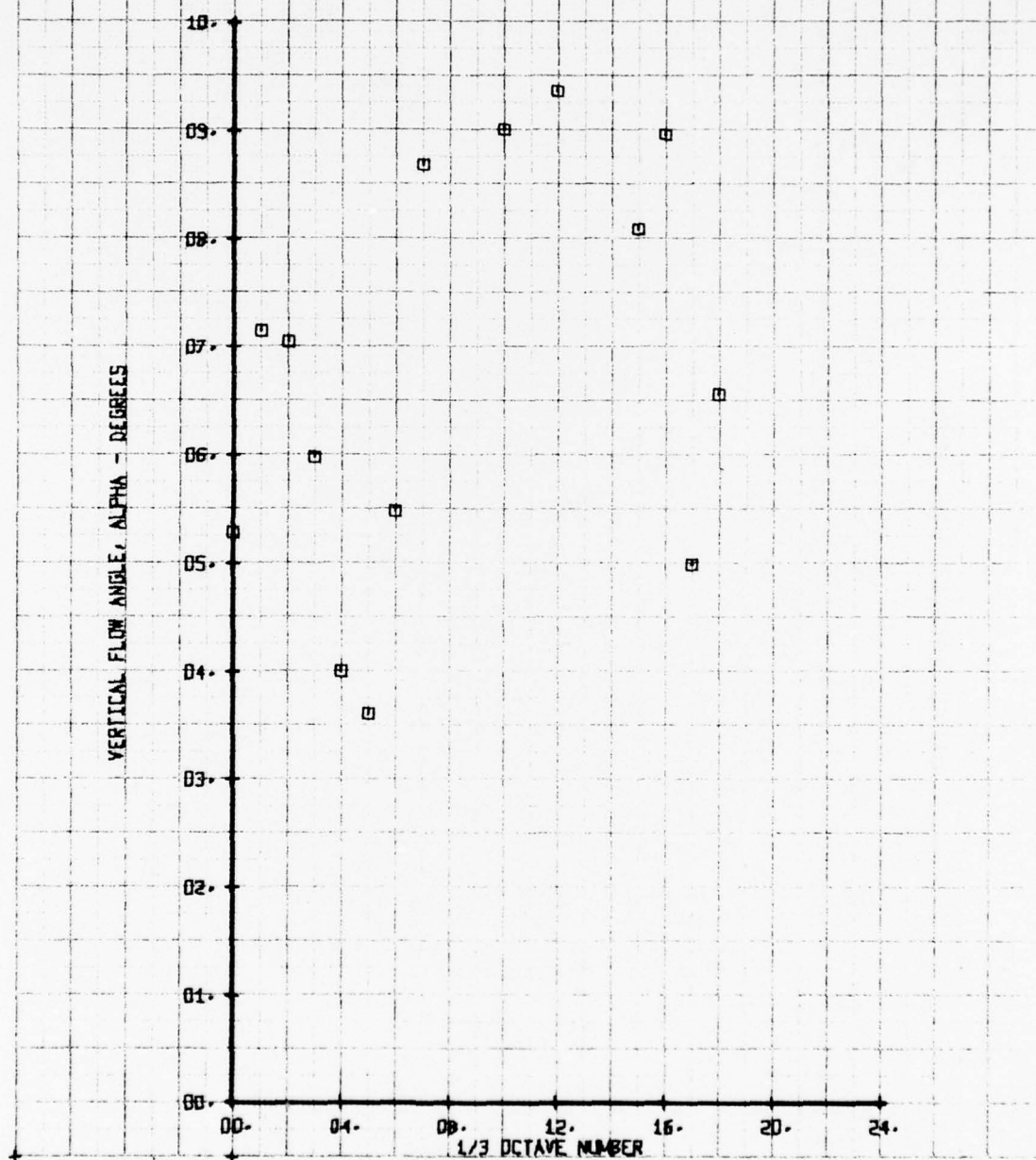


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 3

SYM  
 □

CN  
 66

LEGEND  
 PARAMETER  
 ALPHA

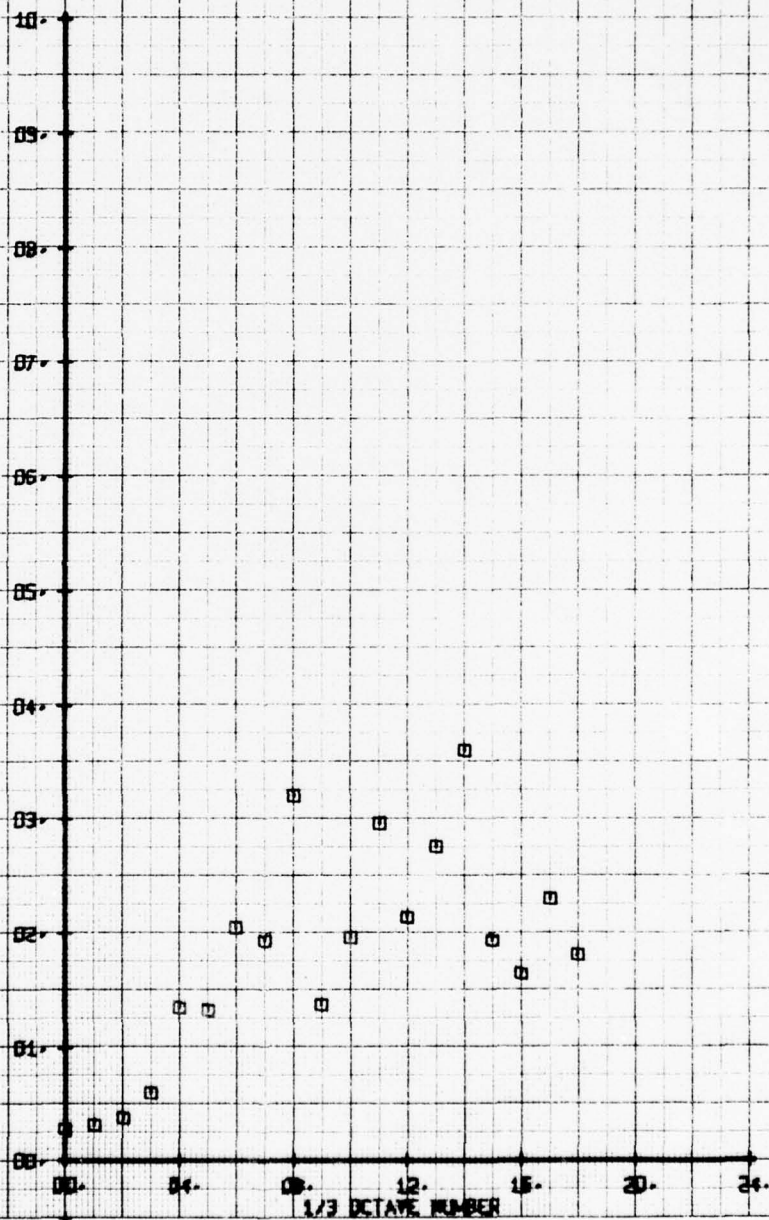




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 4

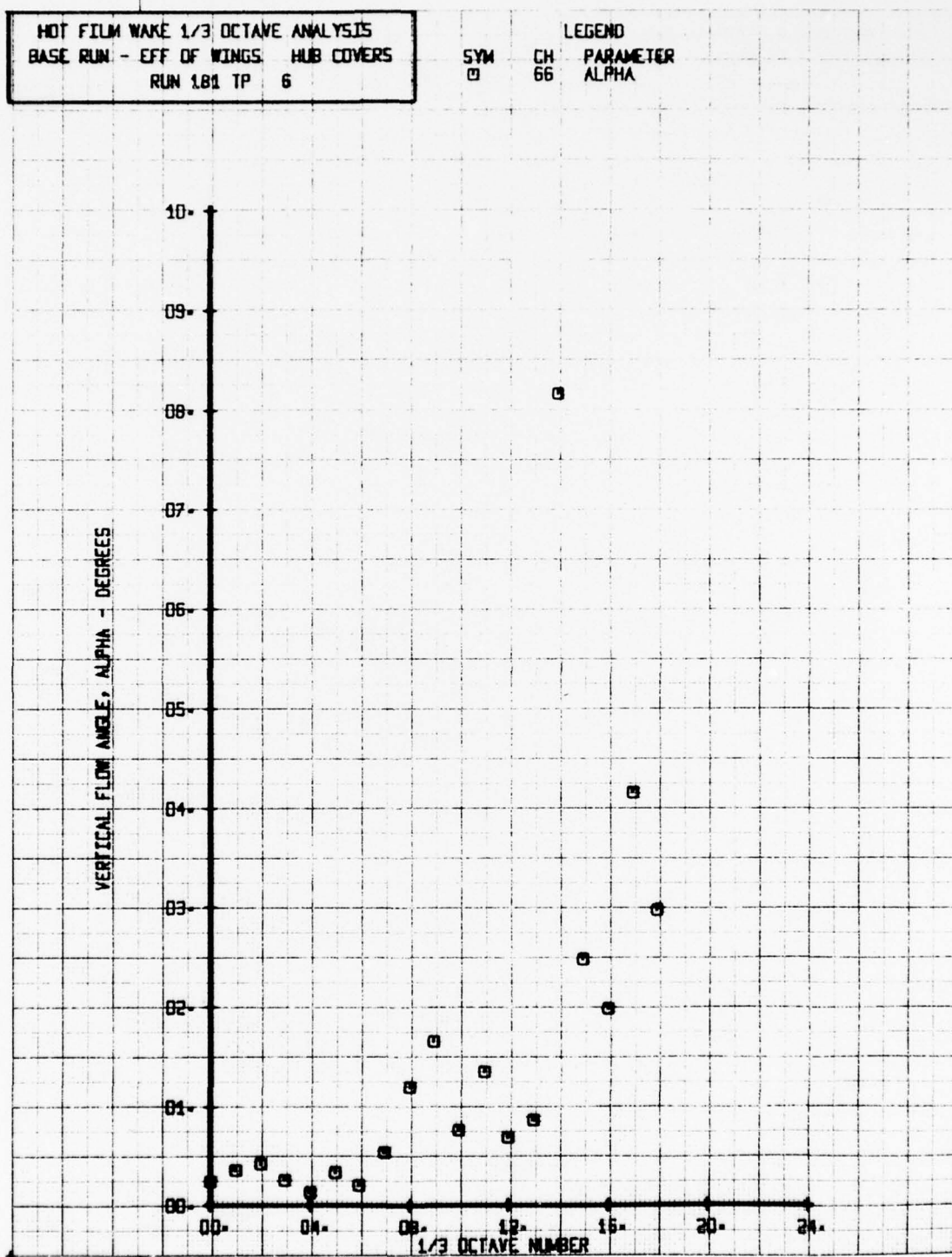
LEGEND  
 CH 66  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 6

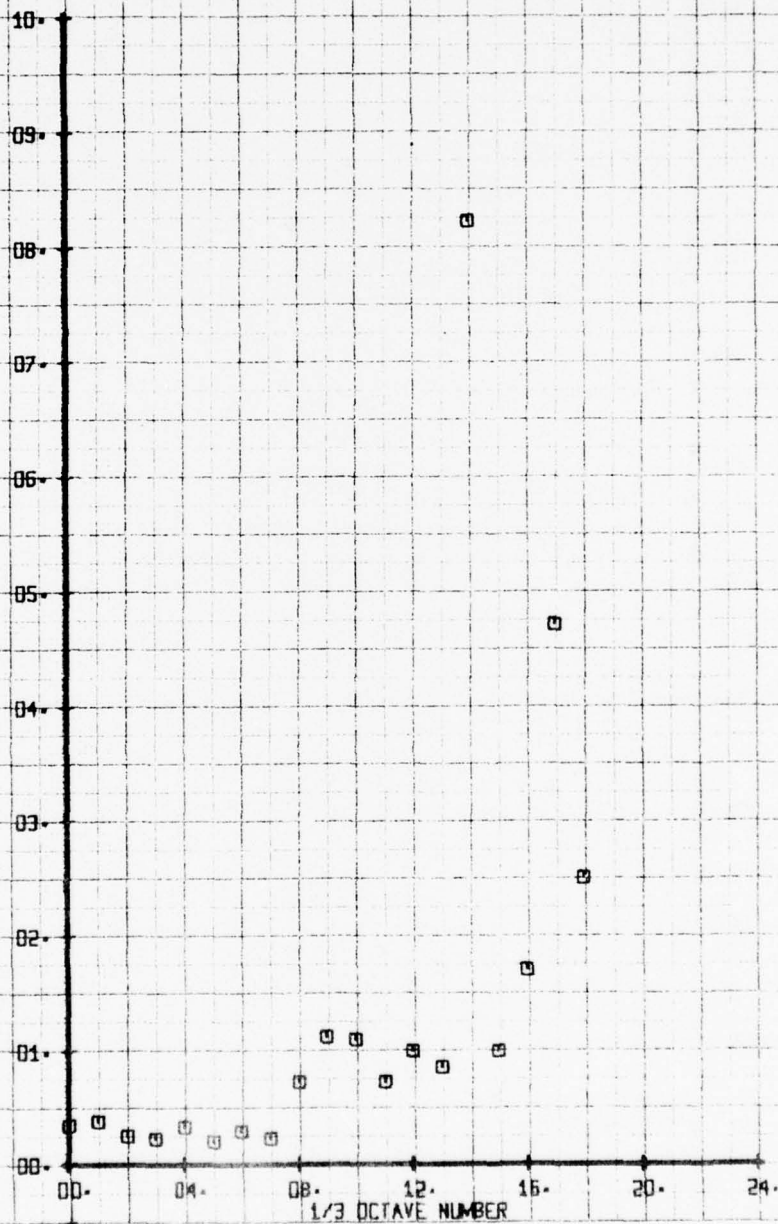
LEGEND  
 SYM CH PARAMETER  
 □ 66 ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 7

SYM CH PARAMETER  
 □ 66 ALPHA

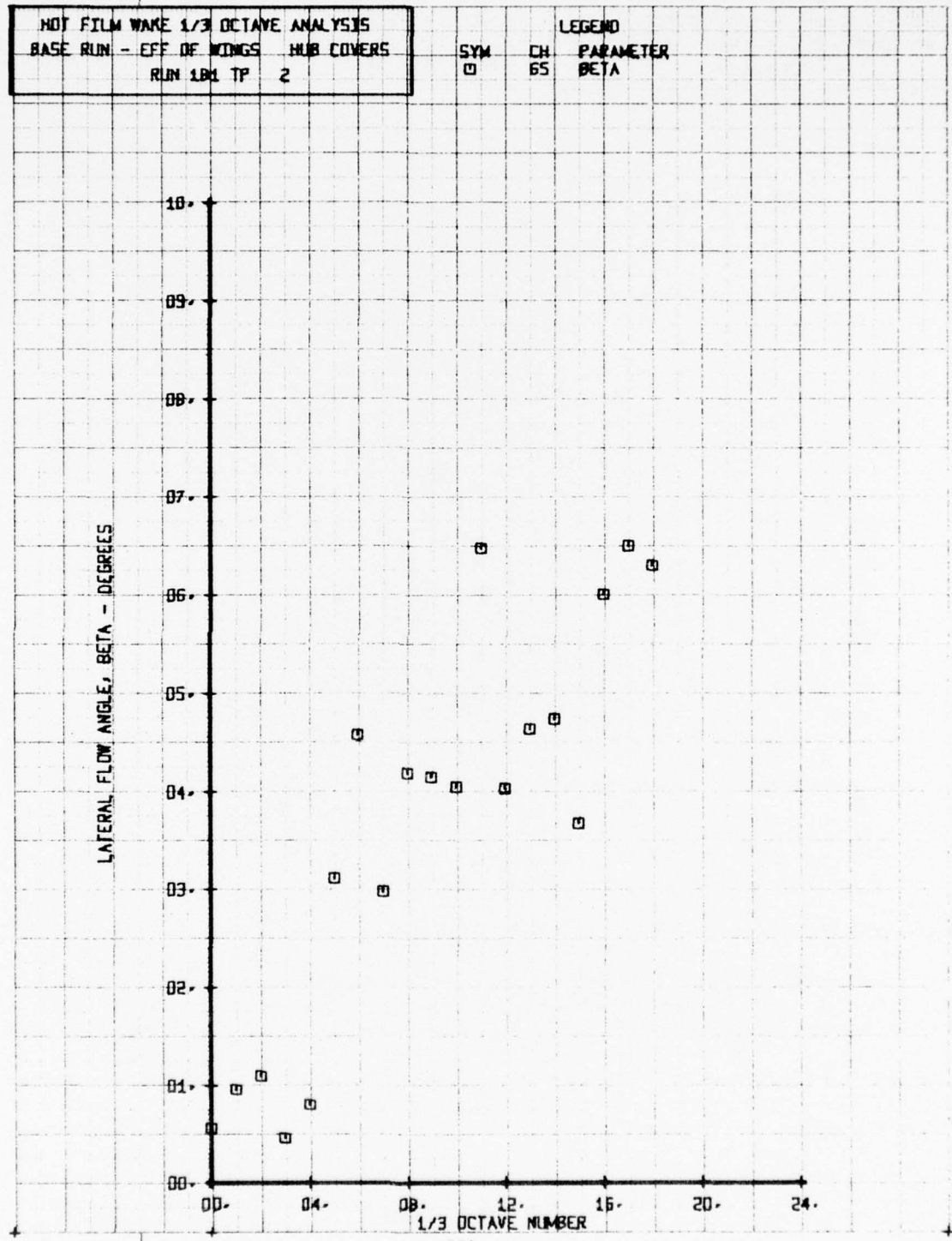
VERTICAL FLOW ANGLE, ALPHA - DEGREES



100

HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 2

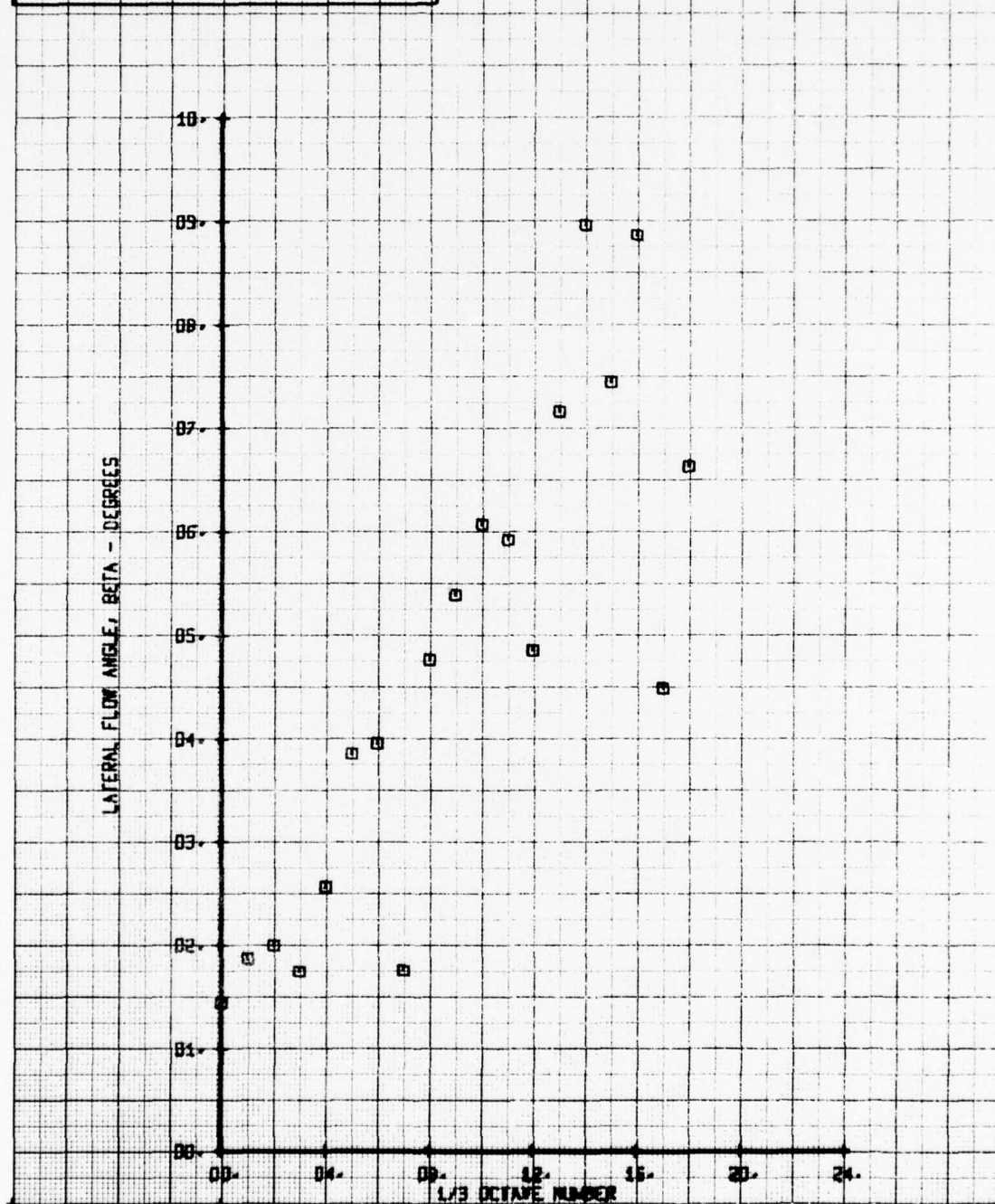
LEGEND  
 SYM CH PARAMETER  
 □ 65 BETA





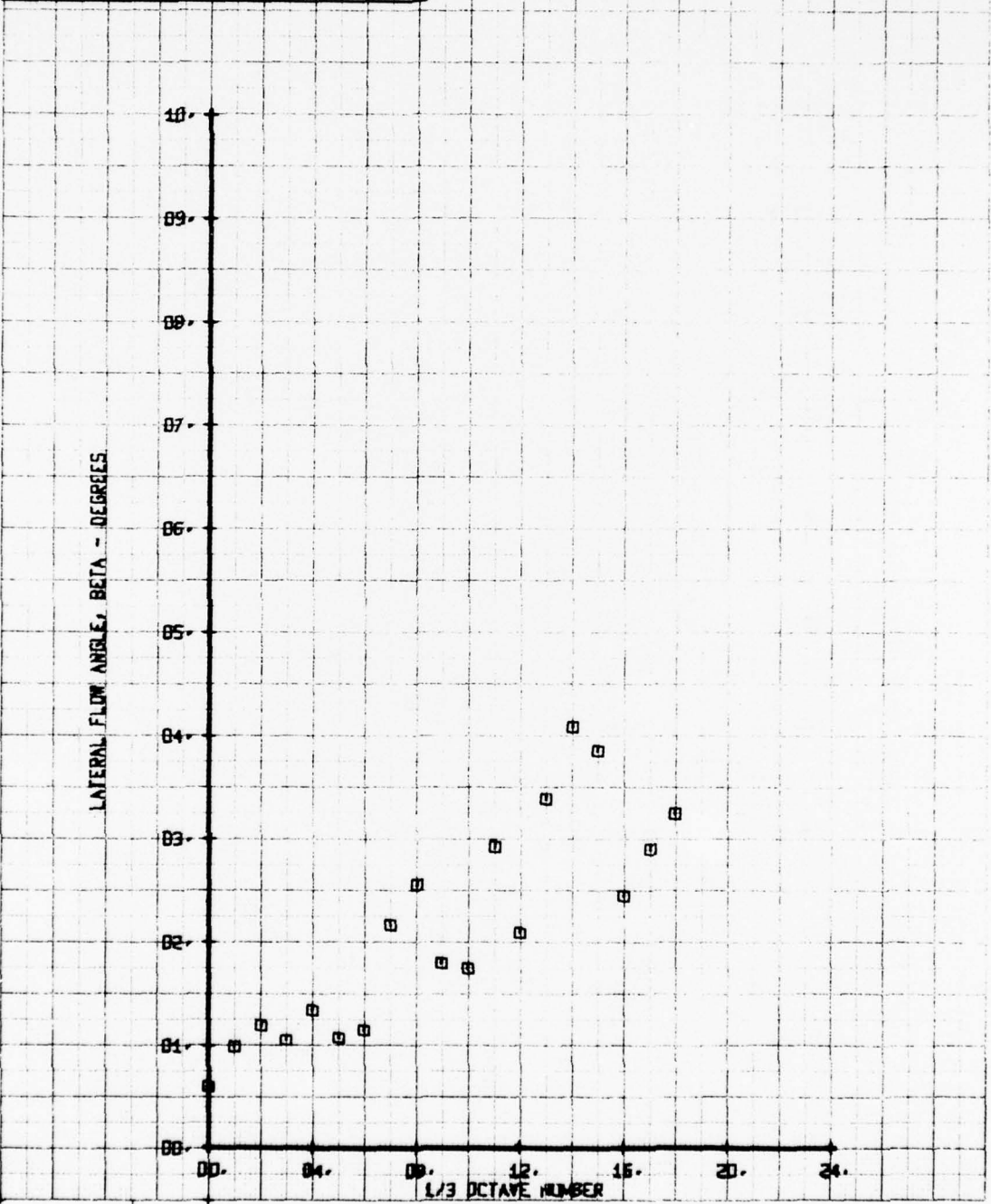
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 3

LEGEND  
 SYM CH PARAMETER  
 □ 65 BETA



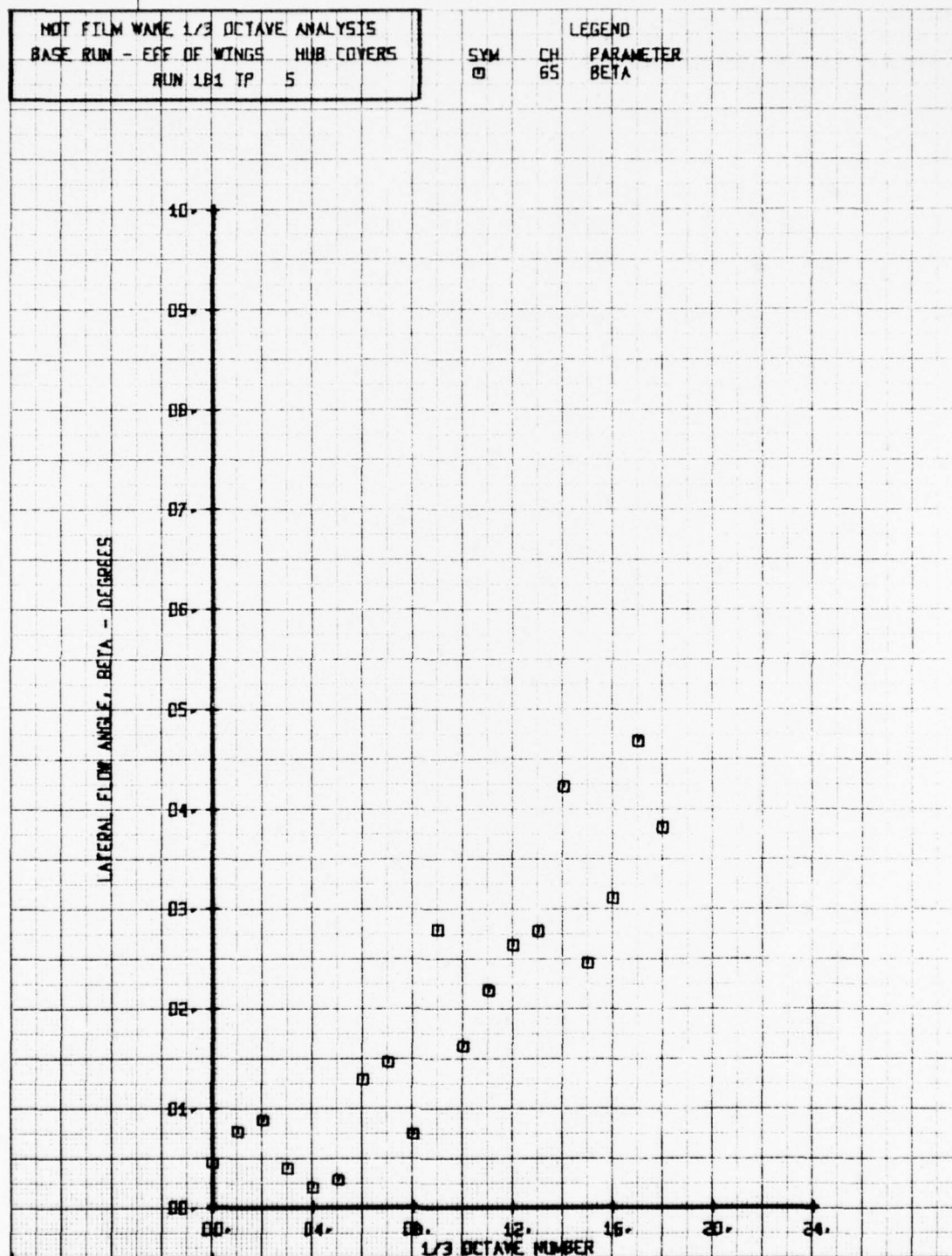
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 1B1 TP 4

SYM CH  
 □ 65  
 LEGEND  
 PARAMETER  
 BETA



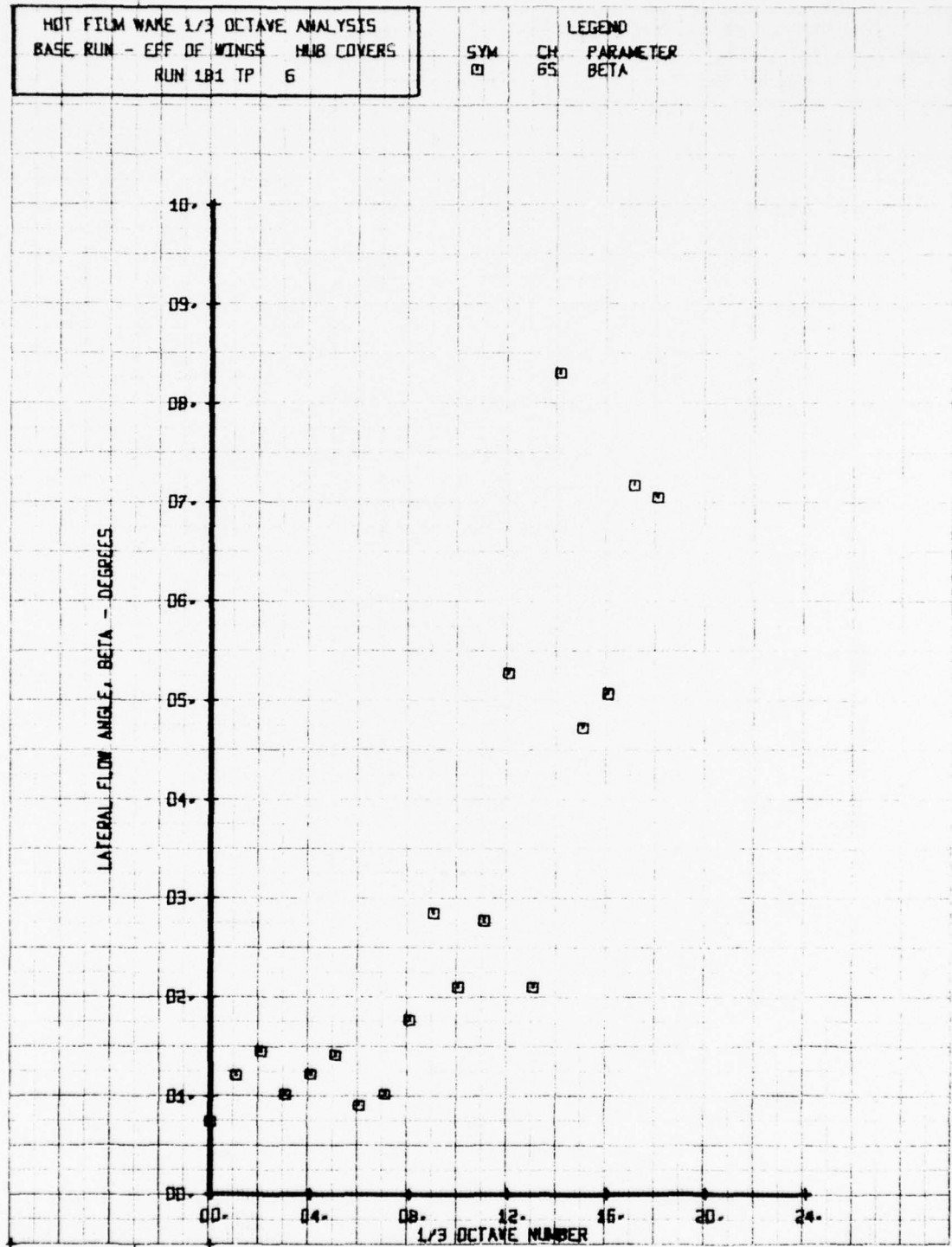
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 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 5

LEGEND  
 SYM CH PARAMETER  
 □ 65 BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 6

LEGEND  
 CH 65  
 SYM  $\square$  PARAMETER BETA

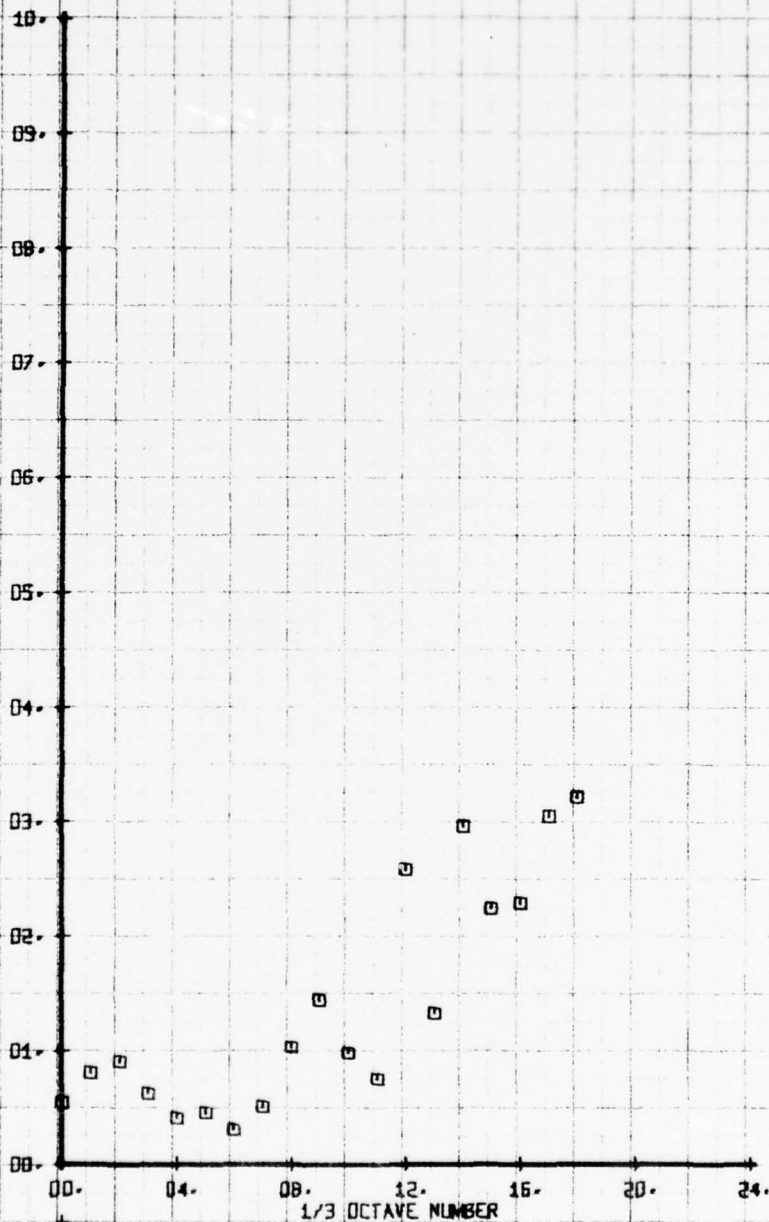




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 101 TP 7

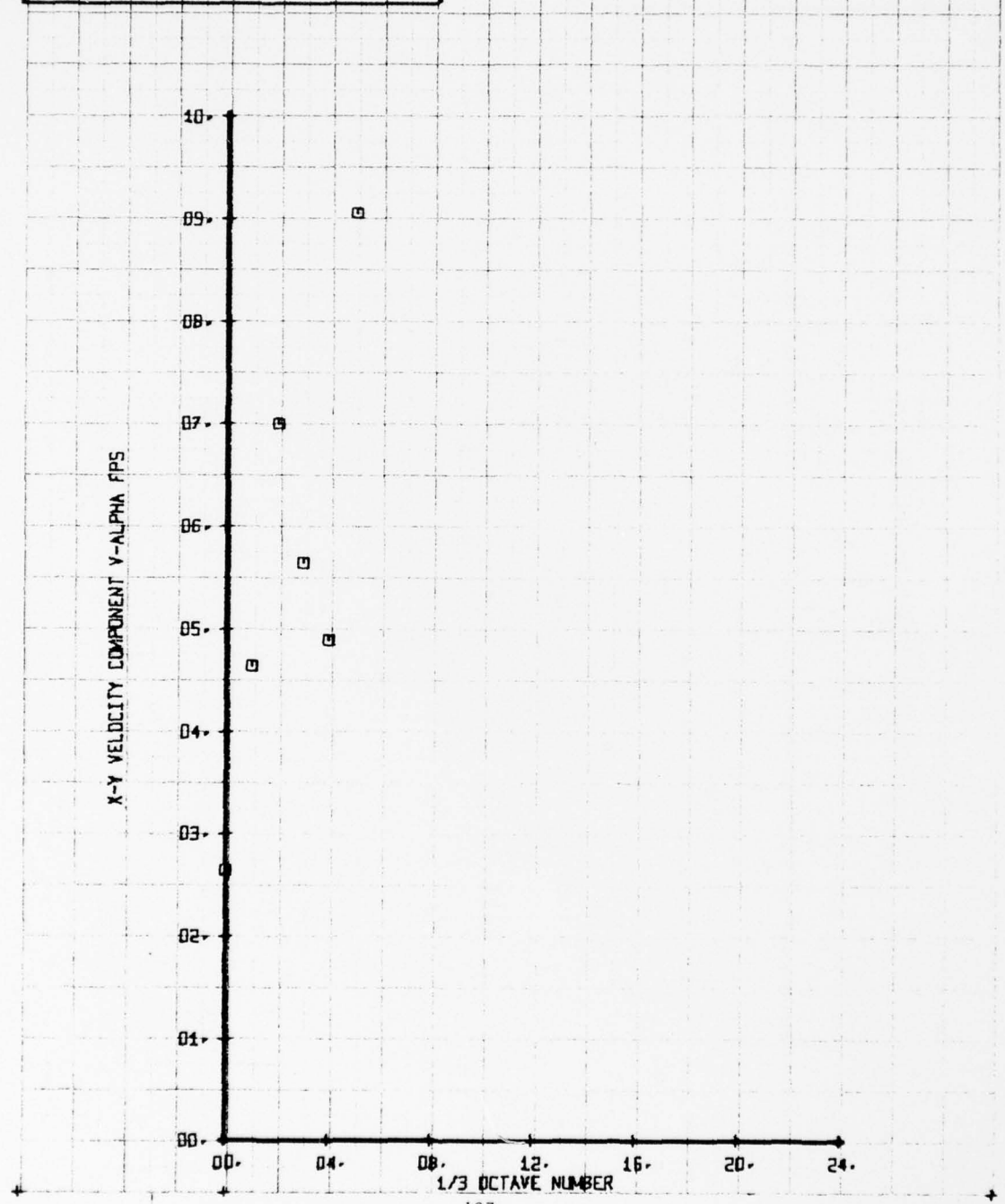
LEGEND  
 CH PARAMETER  
 65 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



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 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 2

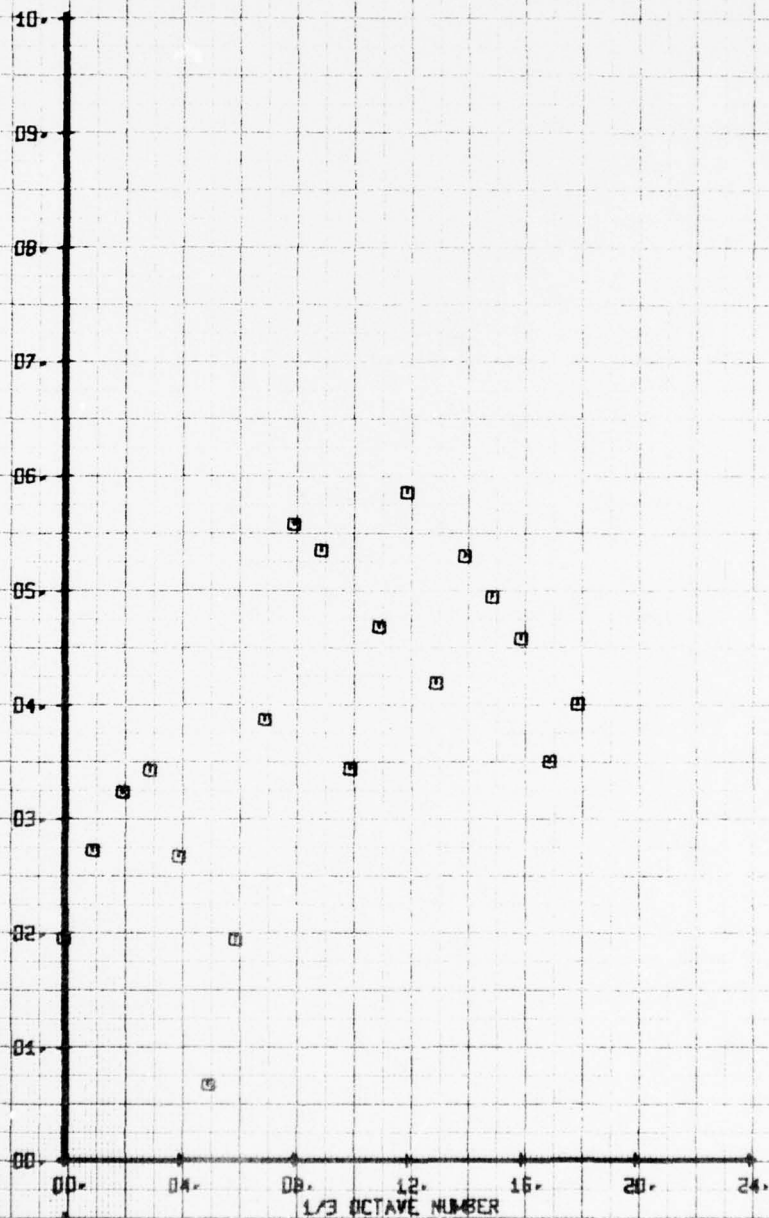
SYM CH  
 0 66  
 LEGEND  
 PARAMETER  
 V-ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 3

LEGEND  
 SYM CH PARAMETER  
 □ 66 V-ALPHA

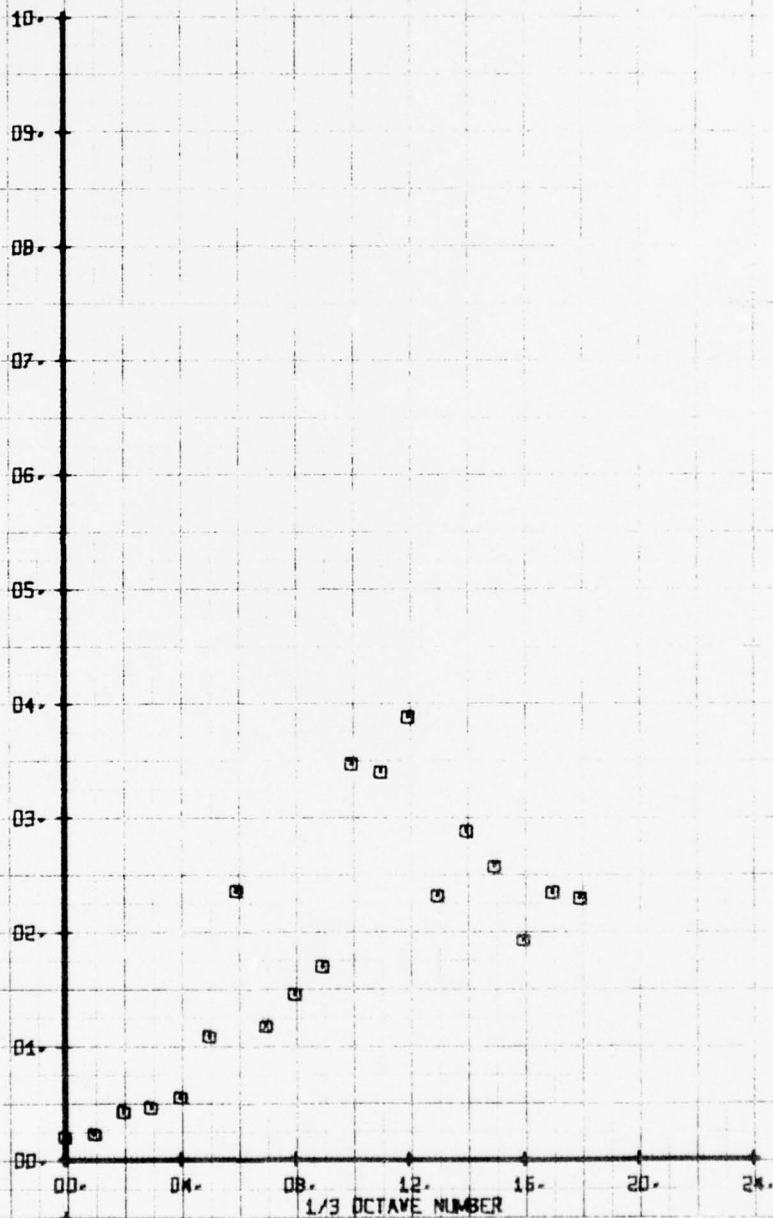
X-Y VELOCITY COMPONENT V-ALPHA FPS



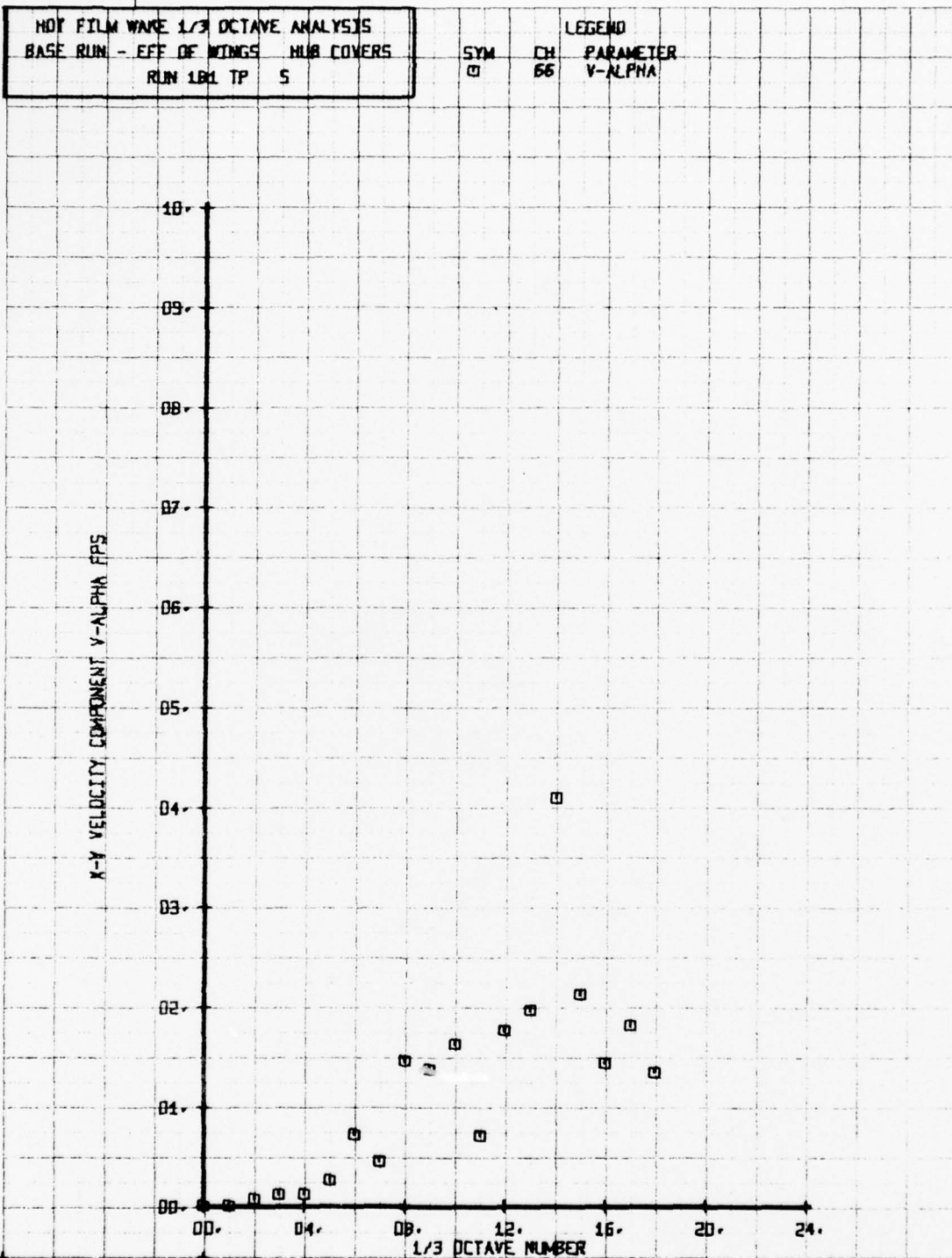
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 1B1 TP 4

LEGEND  
 SYM CH PARAMETER  
 □ 66 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS





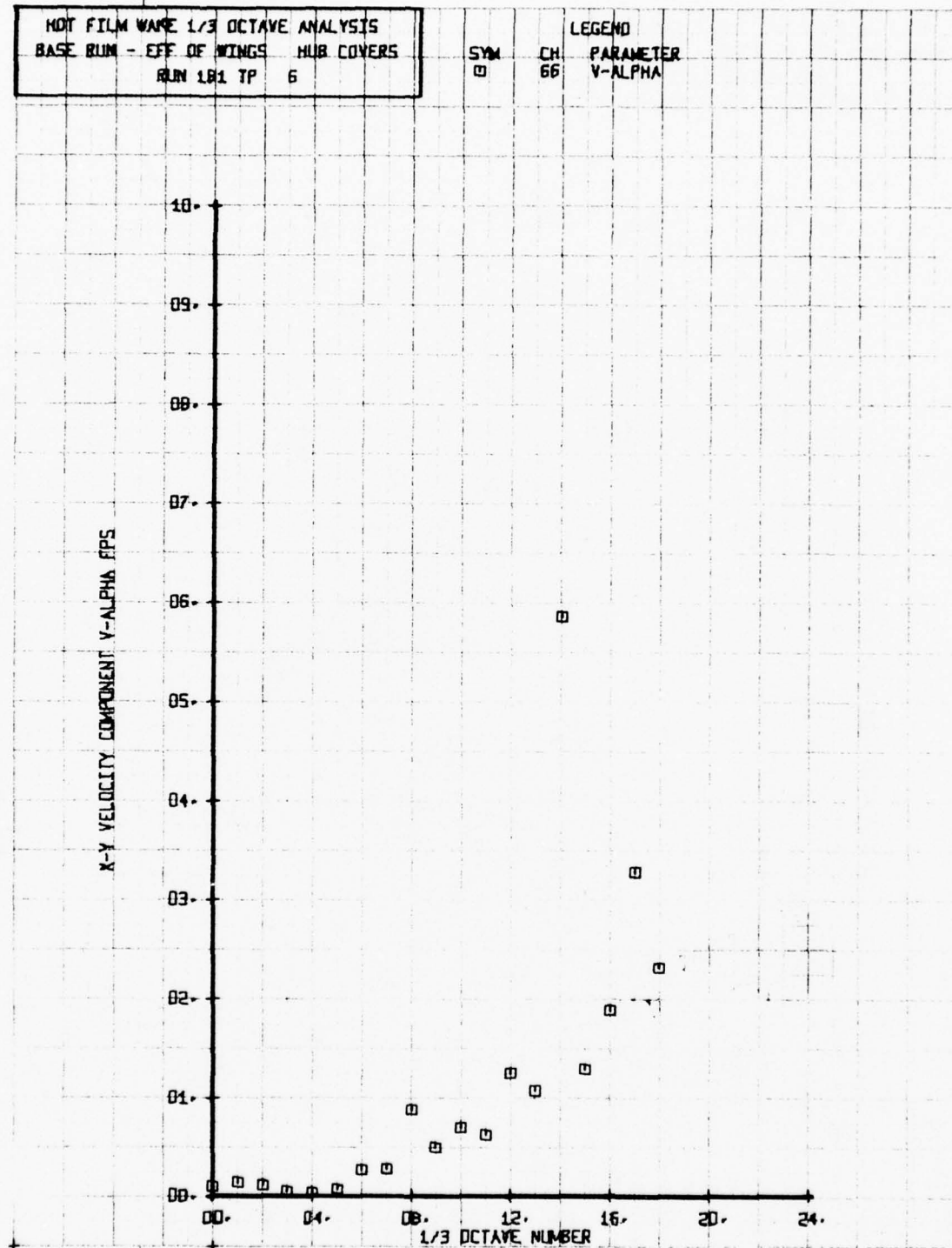


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 6

SYM  
 □

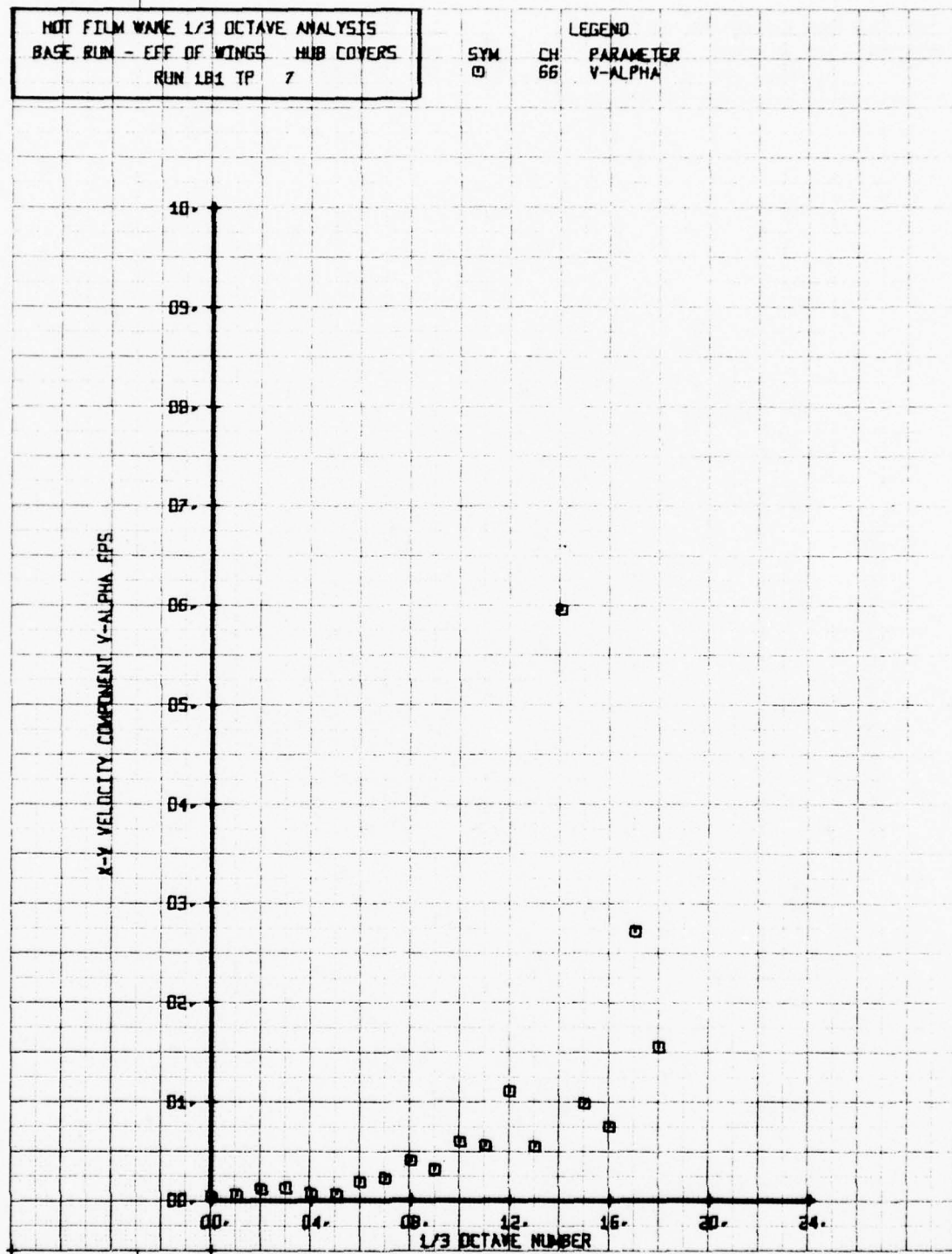
CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA



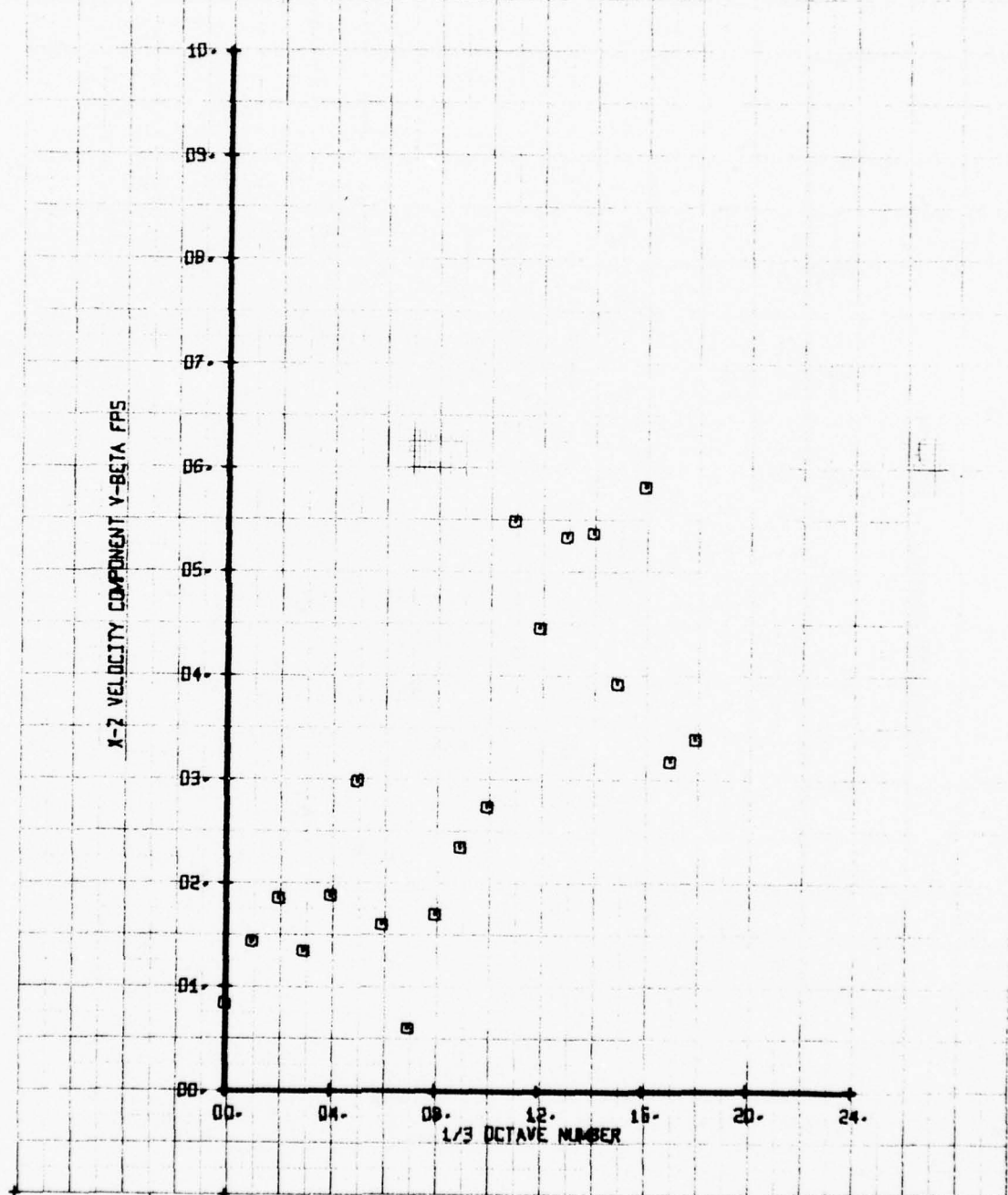
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN LB1 TP 7

LEGEND  
 SYM CH PARAMETER  
 □ 66 V-ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 101 TP 2

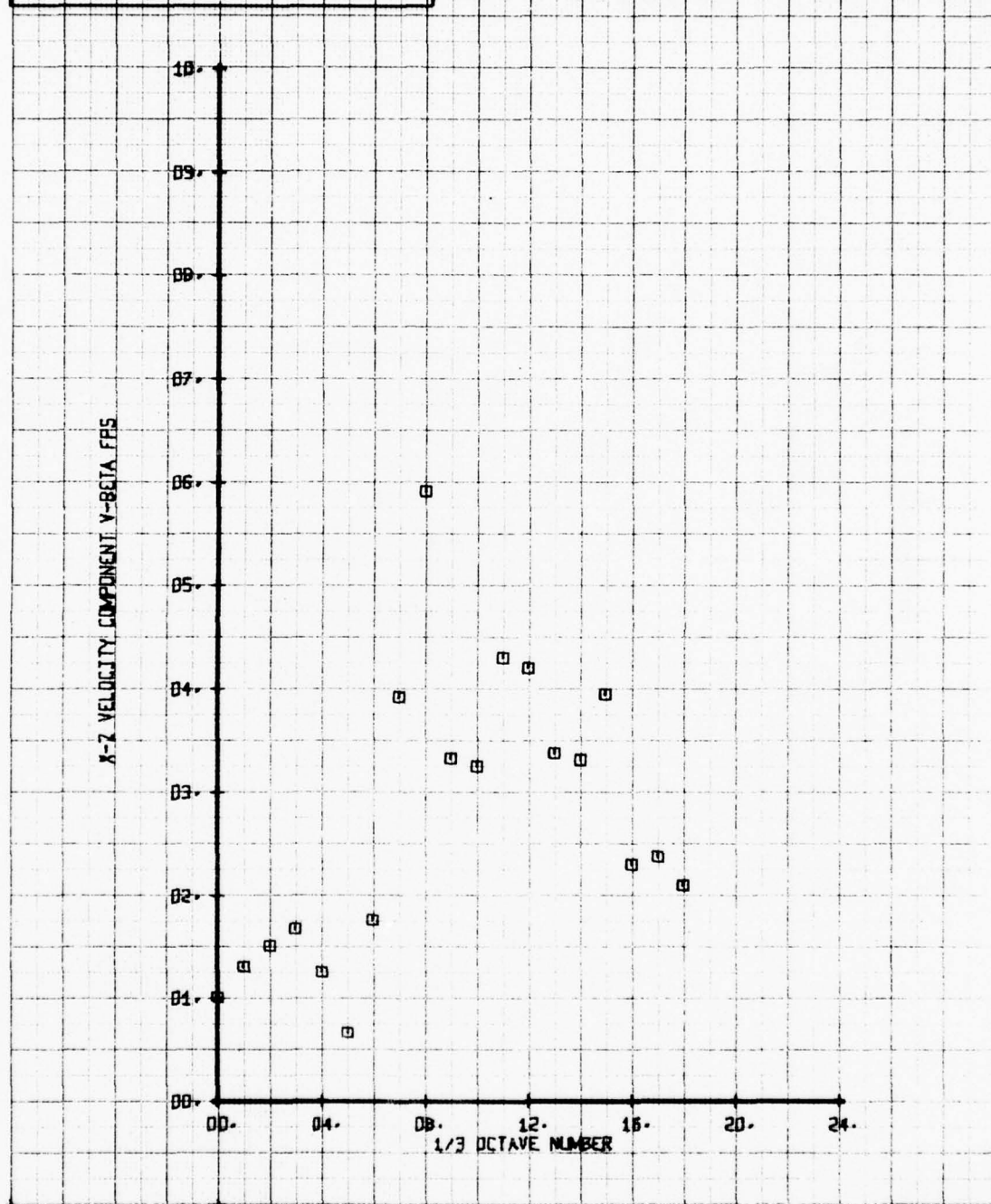
SYN CH LEGEND  
 0 65 PARAMETER  
 V-BETA

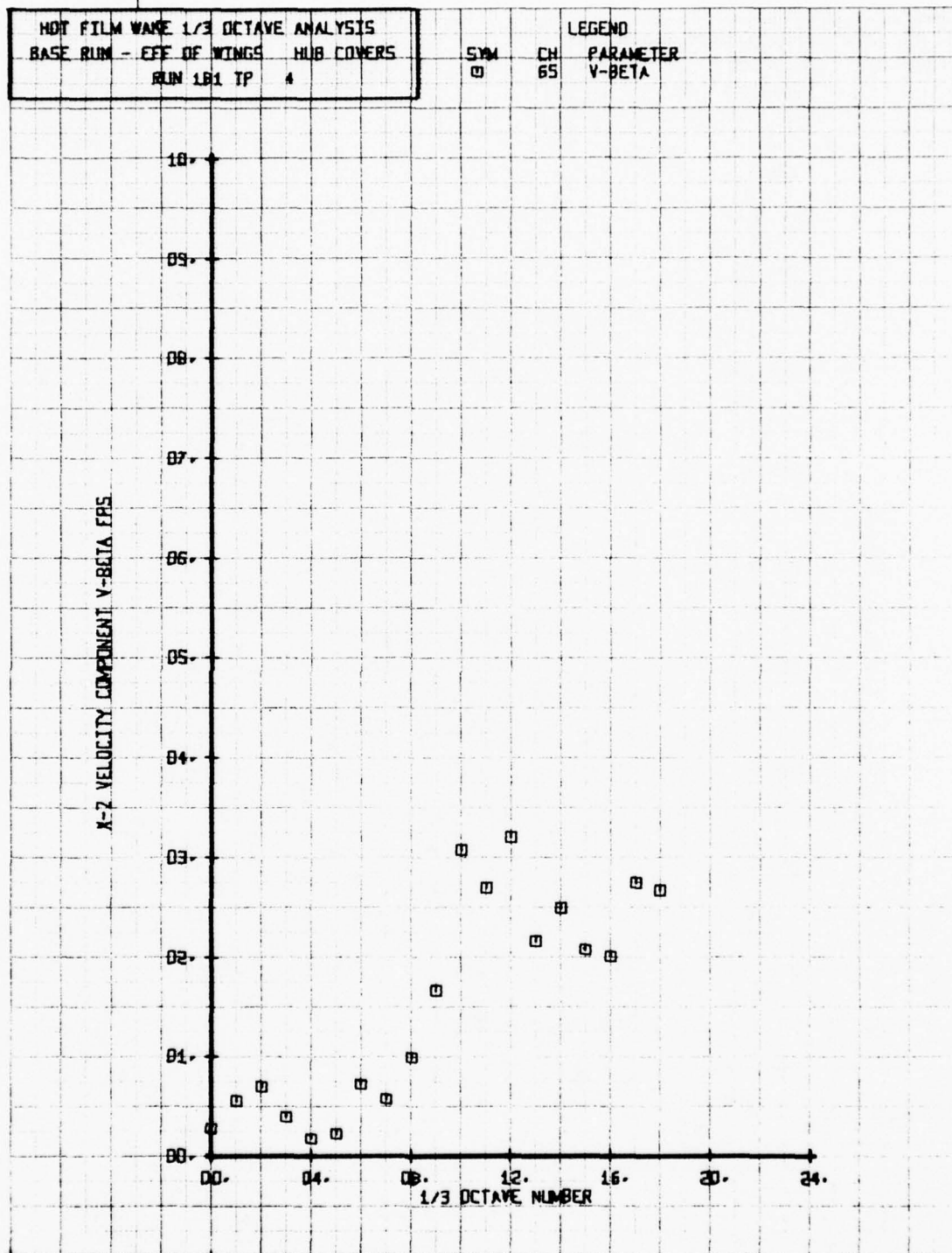




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 184 TP 3

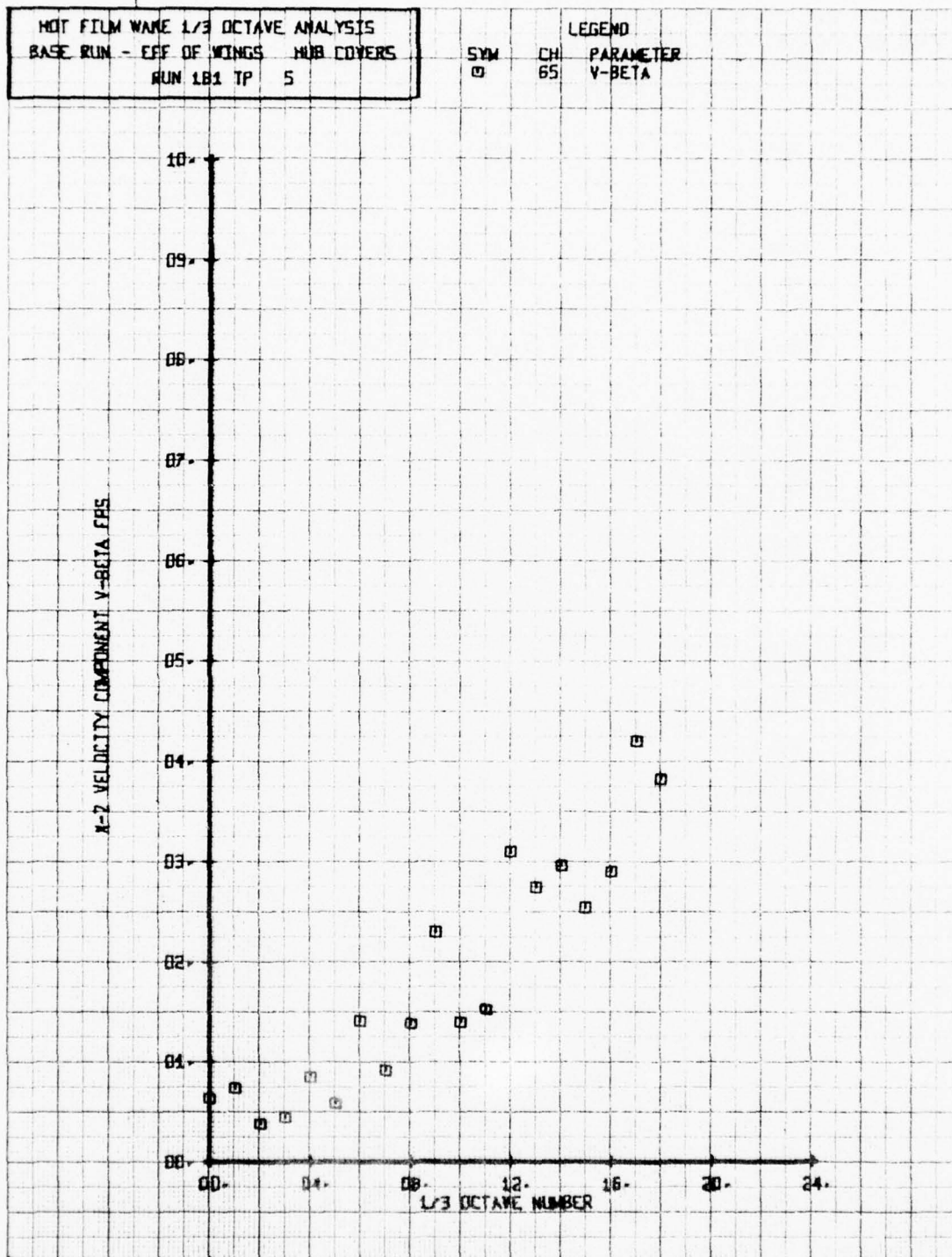
LEGEND  
 SYM CH PARAMETER  
 □ 65 V-BETA





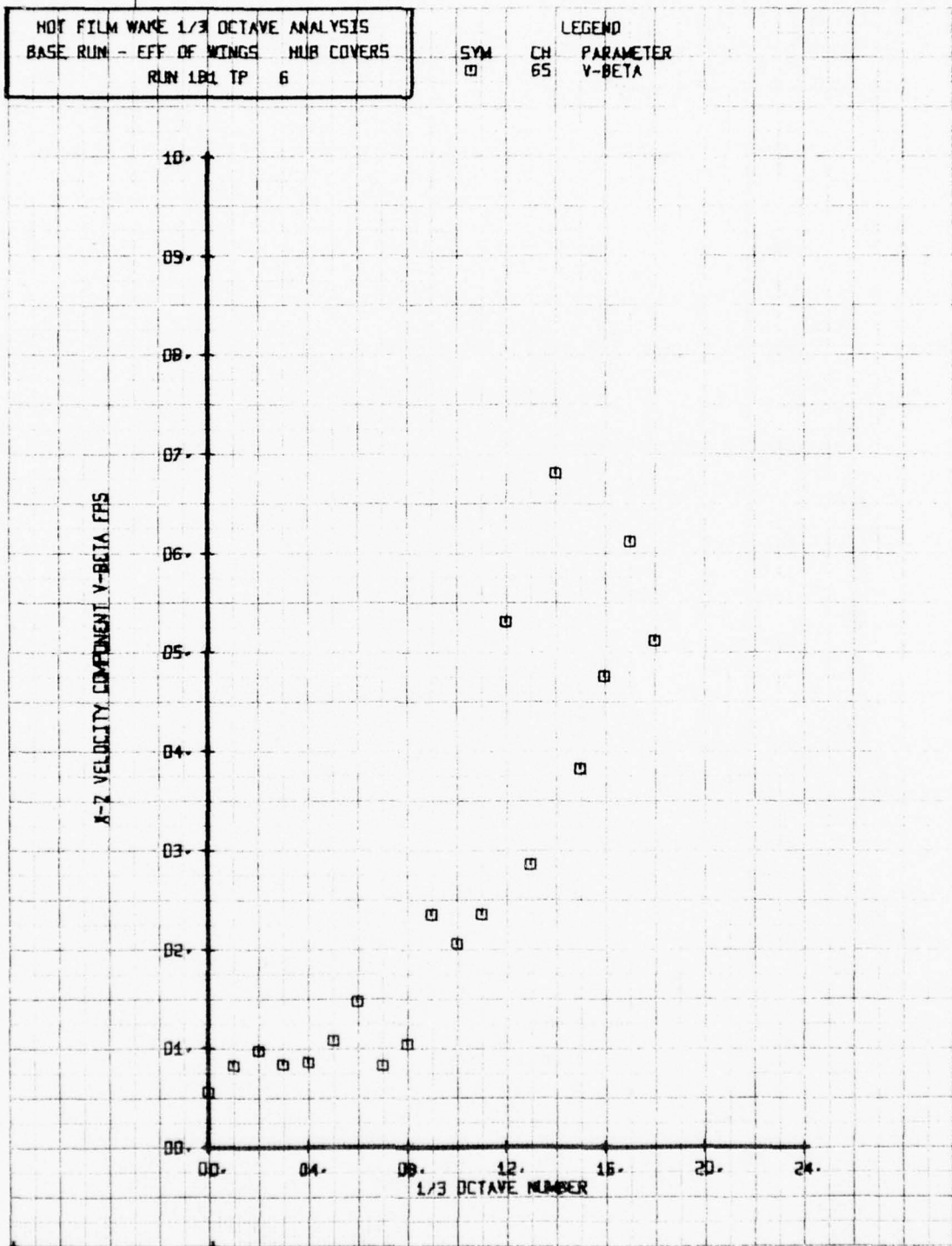
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 5

SYN CH PARAMETER  
 0 65 V-BETA

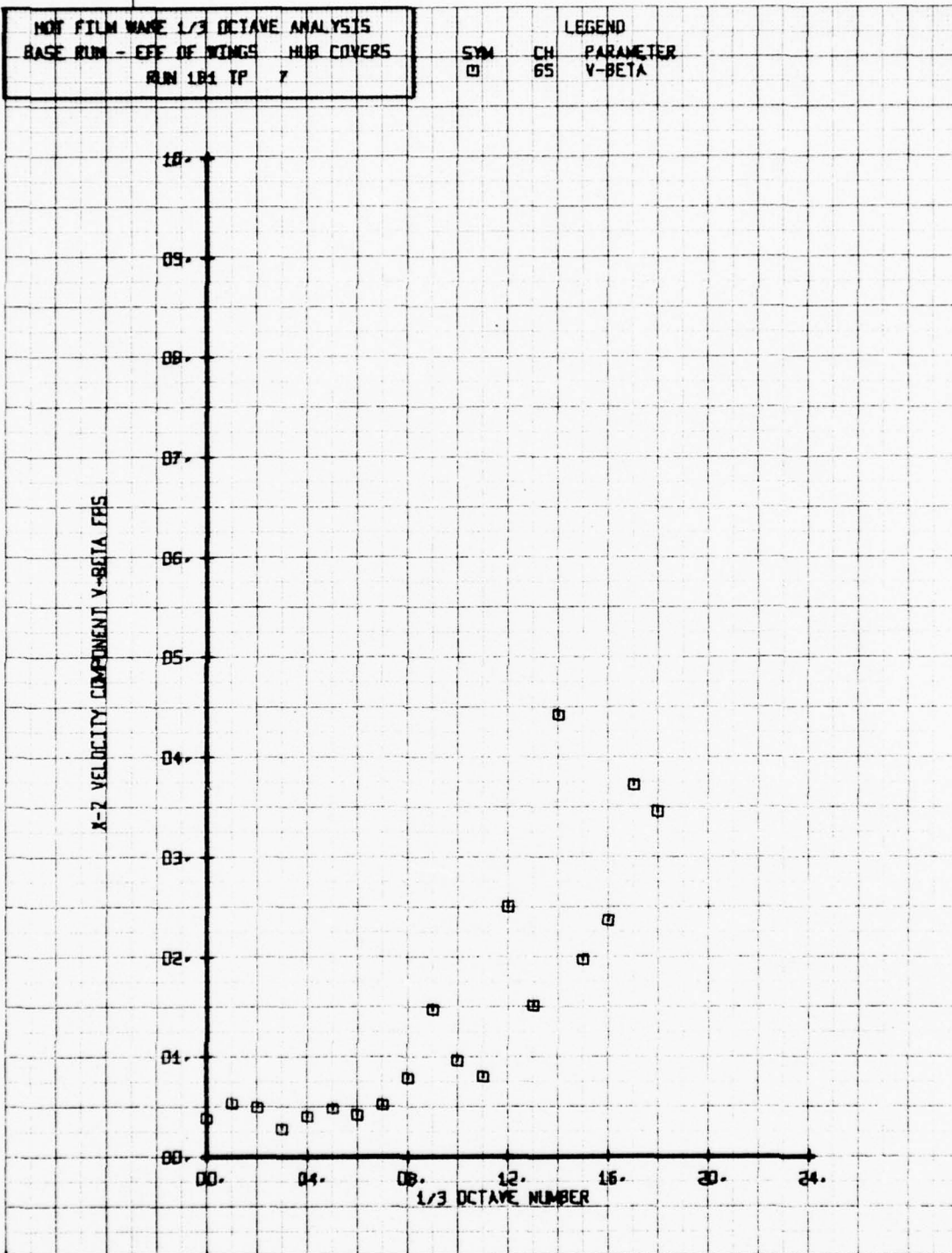


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 BASE RUN - EFF OF WINGS HUB COVERS  
 RUN 181 TP 6

SYM CH PARAMETER  
 □ 65 V-BETA





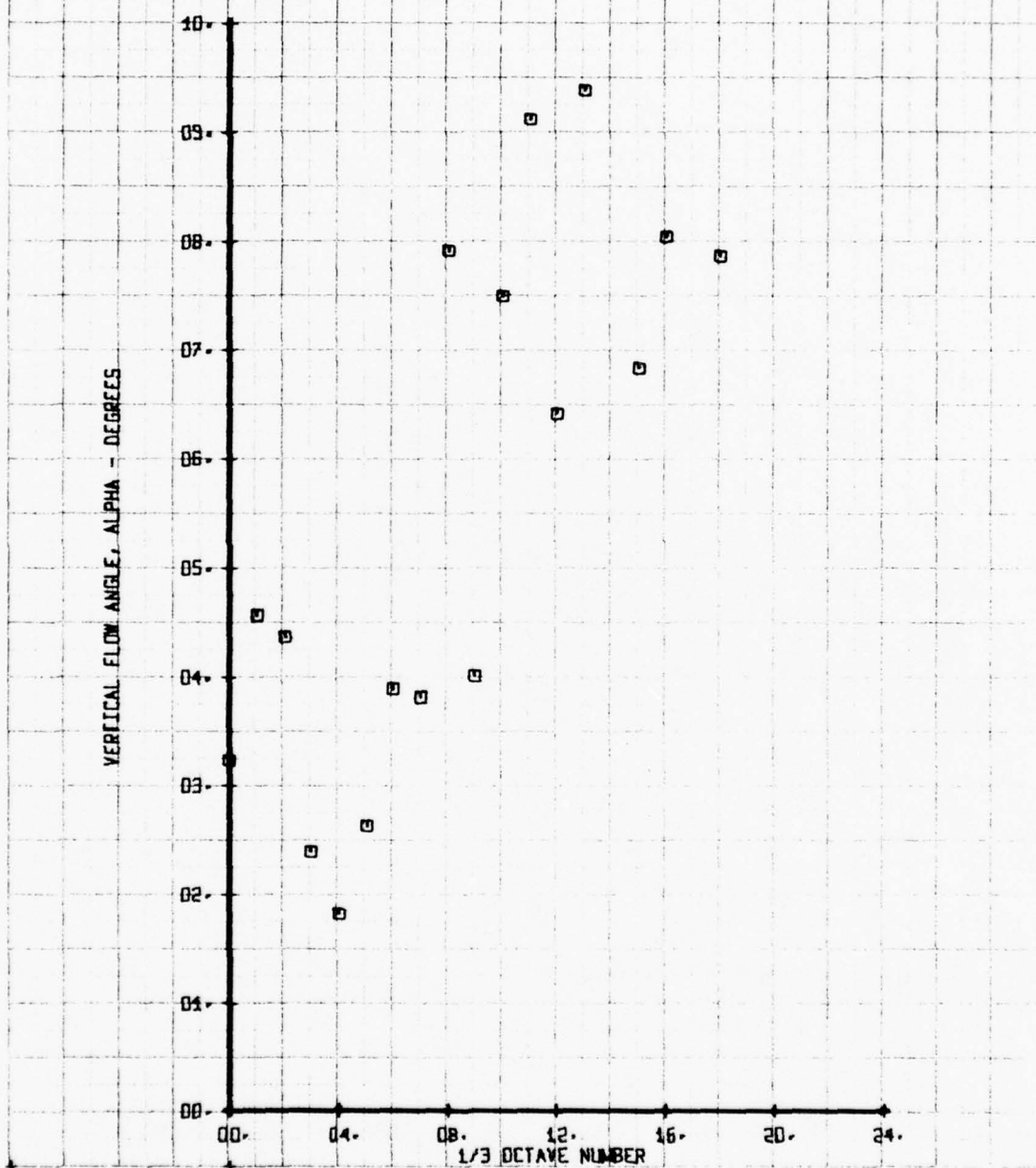


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS GLASS FRISBEE 160  
 RUN 183 TP 4

SYM  
 □

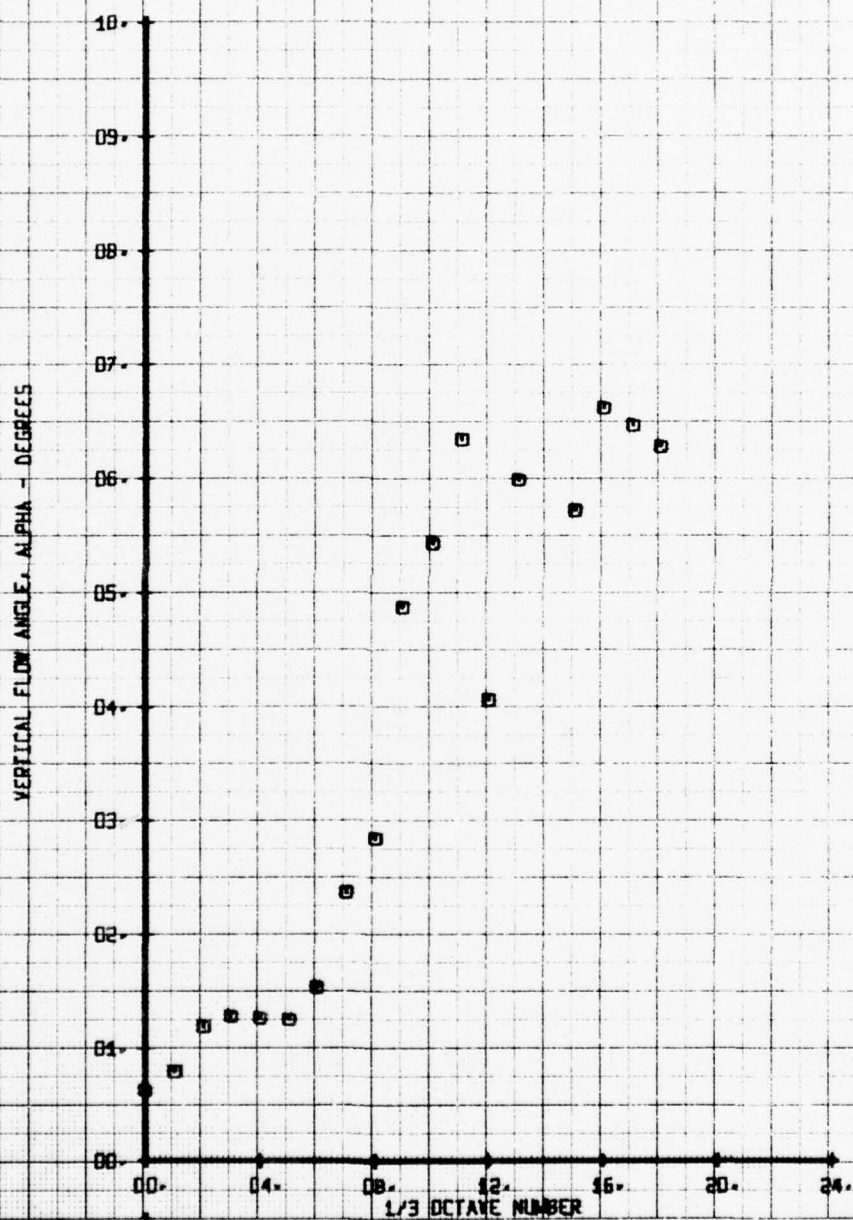
CH  
 66

LEGEND  
 PARAMETER  
 ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS GLASS FRISBEE 160  
 RUN 183 TP 5

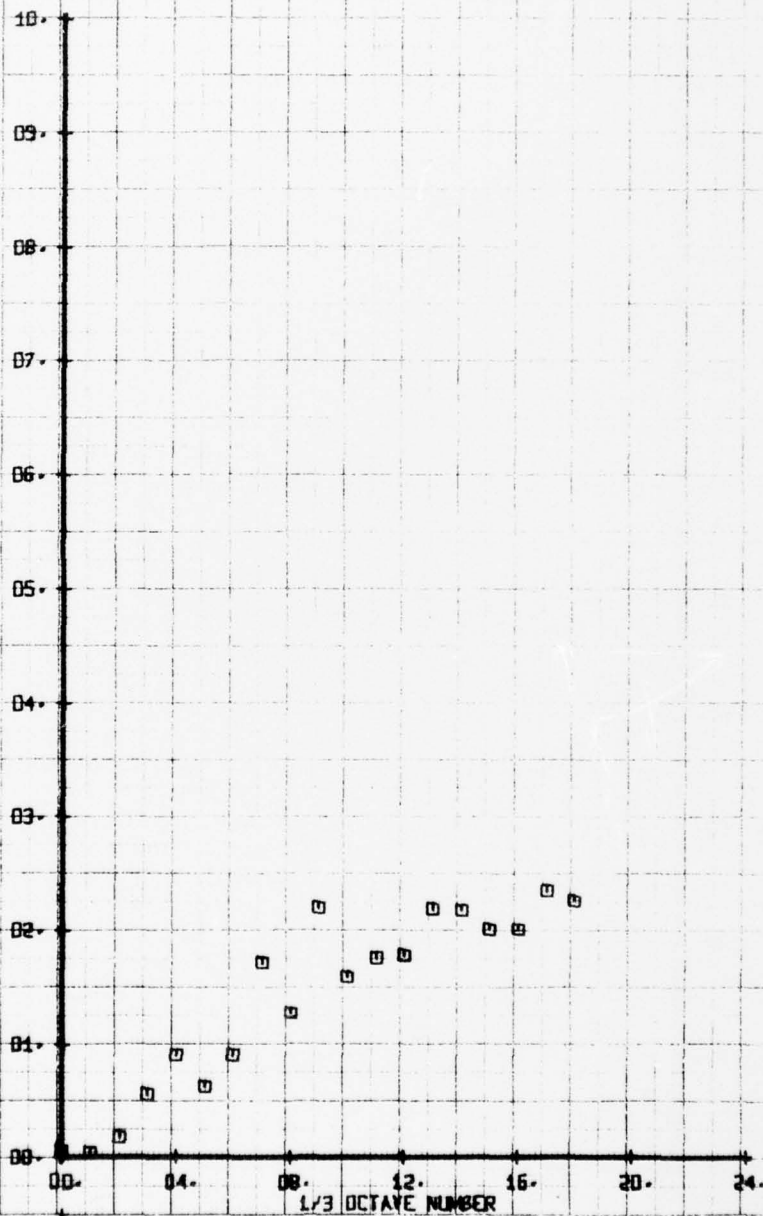
LEGEND  
 CH 66  
 PARAMETER  
 ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS GLASS FRISBEE 160  
 RUN 183 TP 6

LEGEND  
 CH 66  
 SYM  $\square$  PARAMETER ALPHA

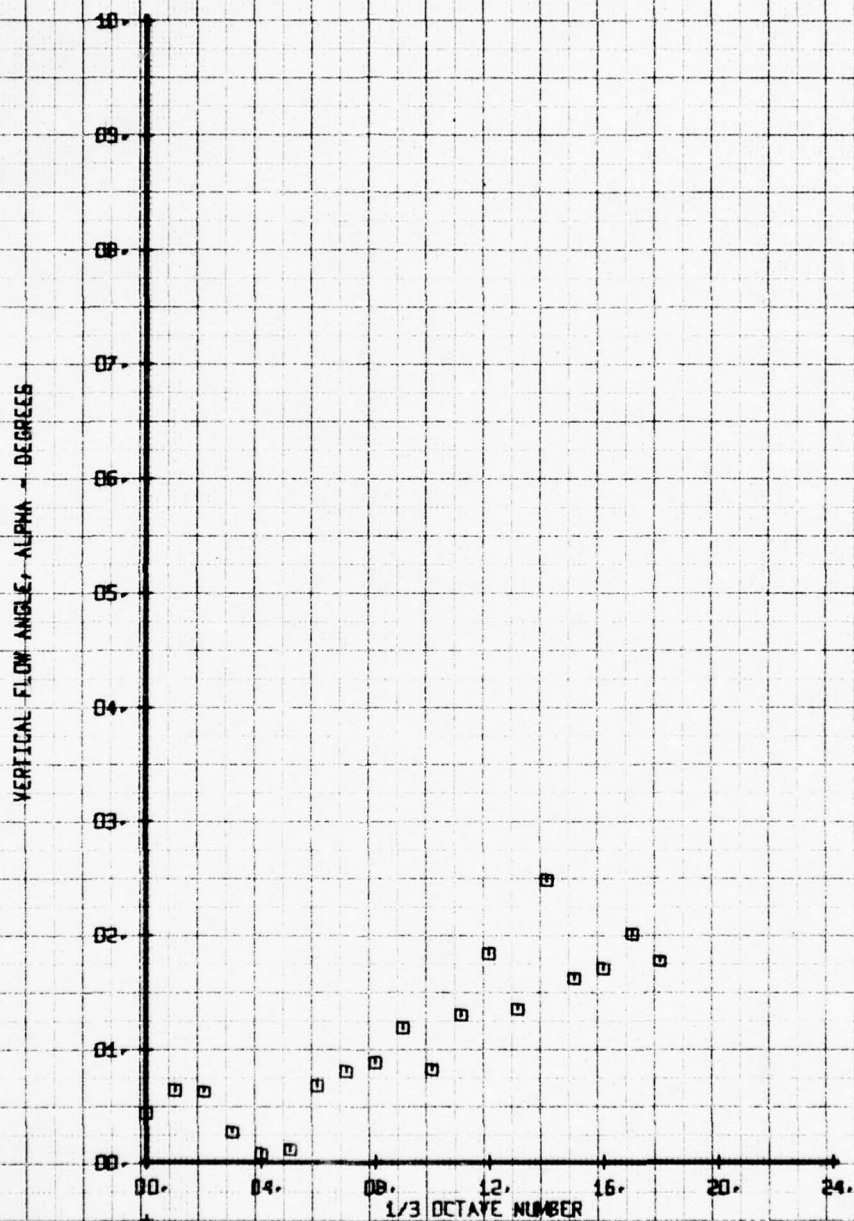
VERTICAL FLOW ANGLE, ALPHA - DEGREES





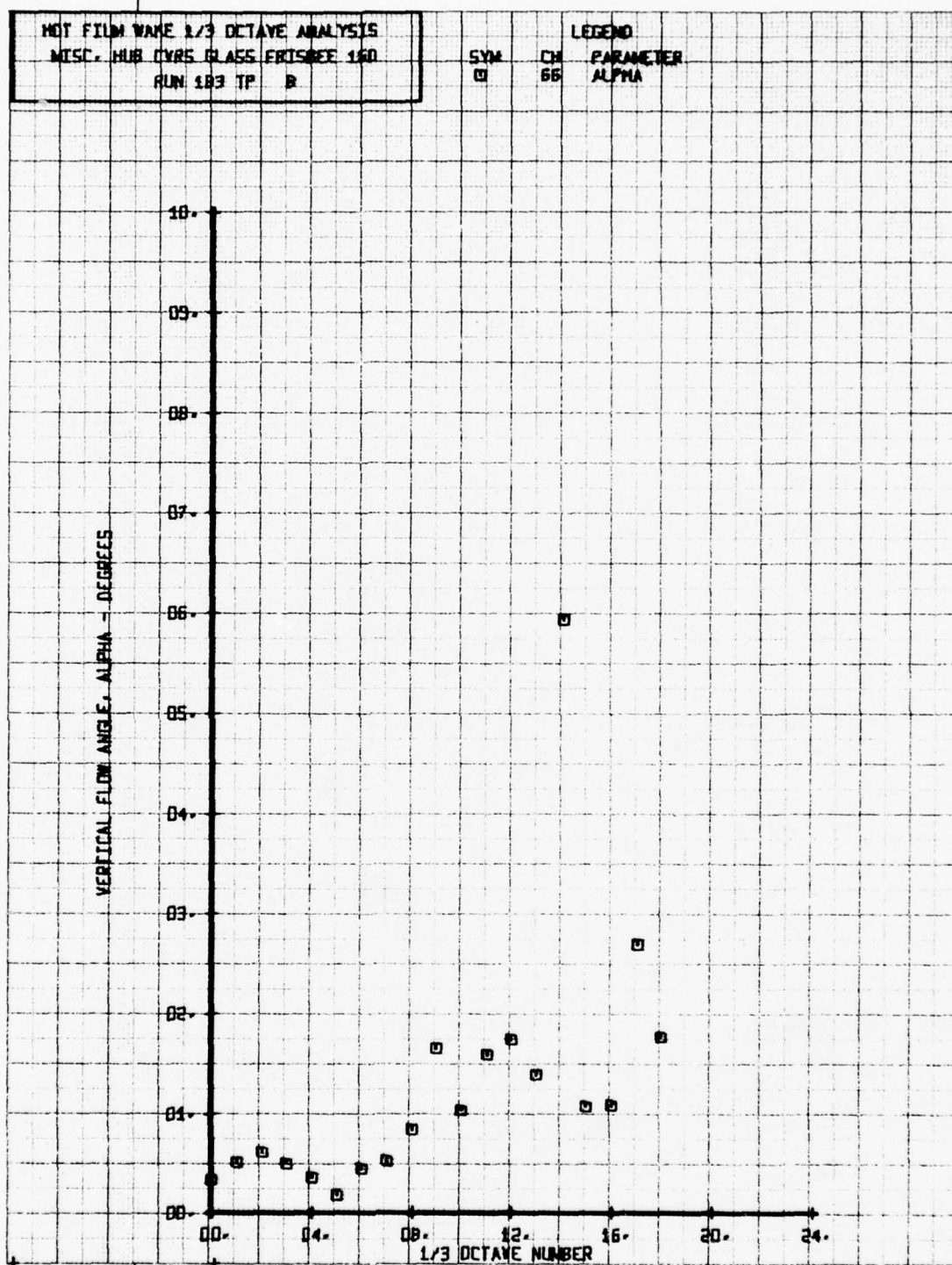
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 MISC. MUR CYRS GLASS FRISBEE 150  
 RUN 183 TP 7

LEGEND  
 CH PARAMETER  
 66 ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS GLASS FRISBEE 160  
 RUN 183 TP B

LEGEND  
 SYM CH PARAMETER  
 □ 66 ALPHA



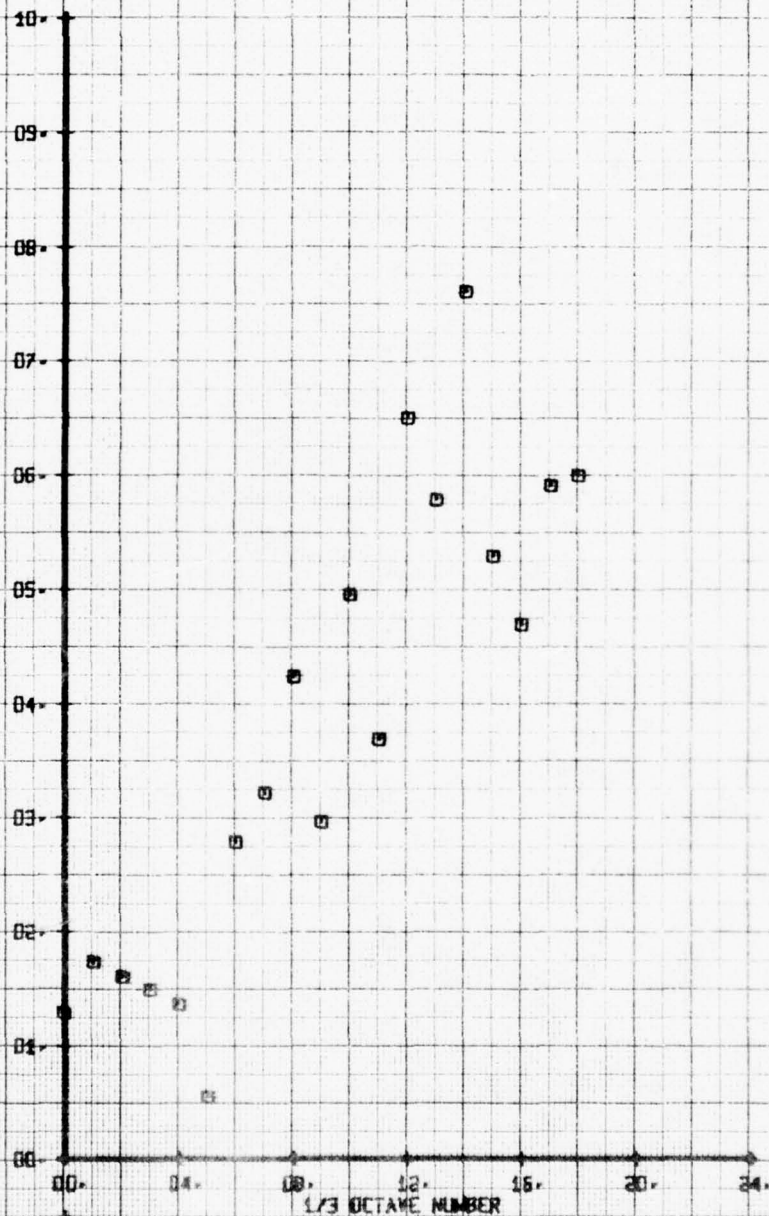
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 MISC. HUB CVRS GLASS FRISBEE 160  
 RUN 183 TP 4

SYM  
 0

CH  
 65

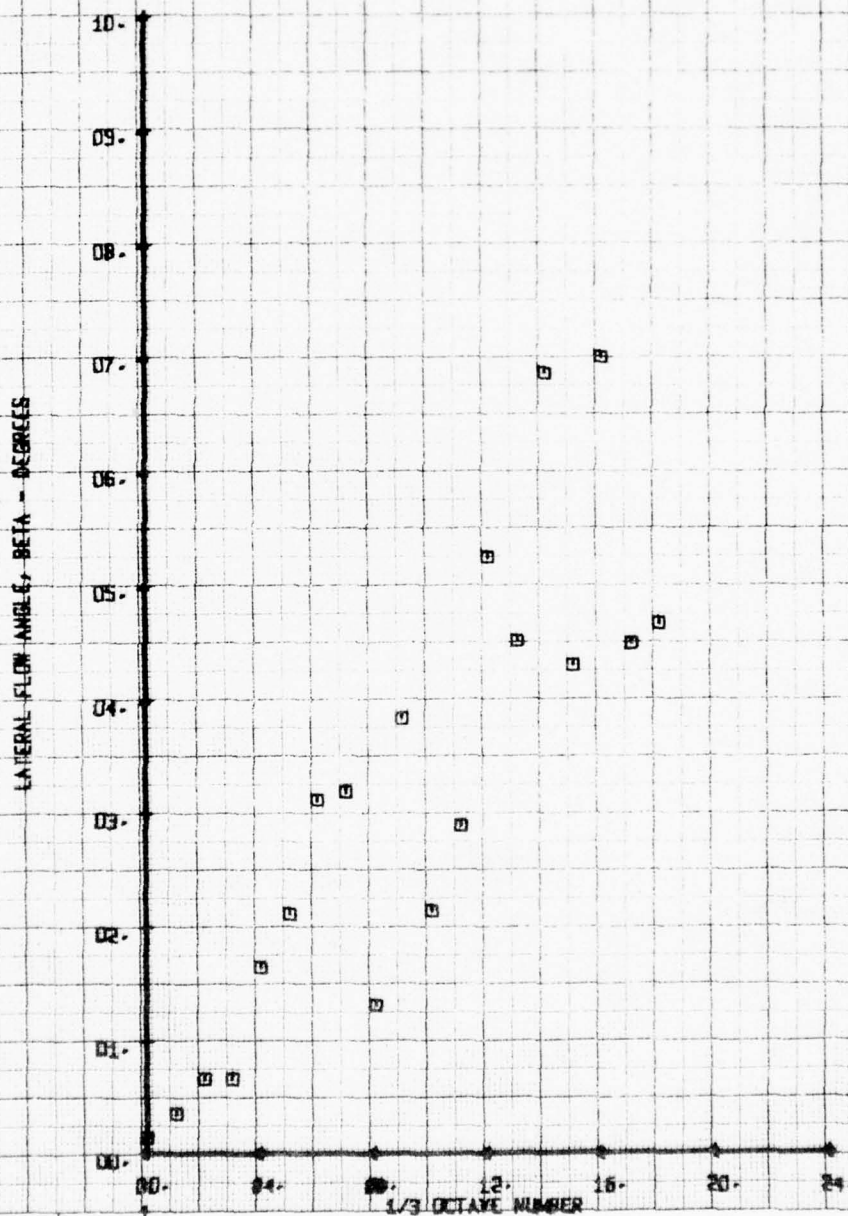
LEGEND  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS GLASS FRISBEE 150  
 RUN 109 TP 5

LEGEND  
 SYM CM PARAMETER  
 □ 65 BETA

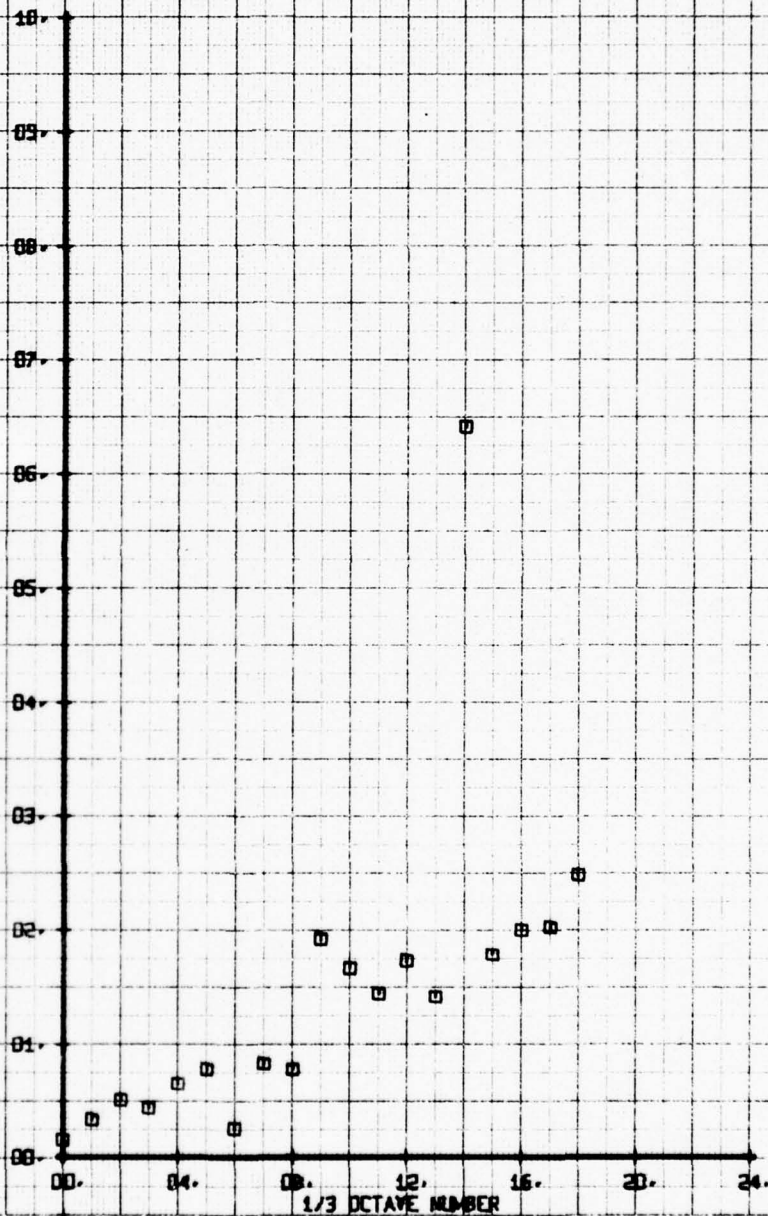




NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. MUR CYNOS GLASS FRISBEE 160  
 RUN 183 TP 6

SYM	CH	LEGEND
0	65	PARAMETER BETA

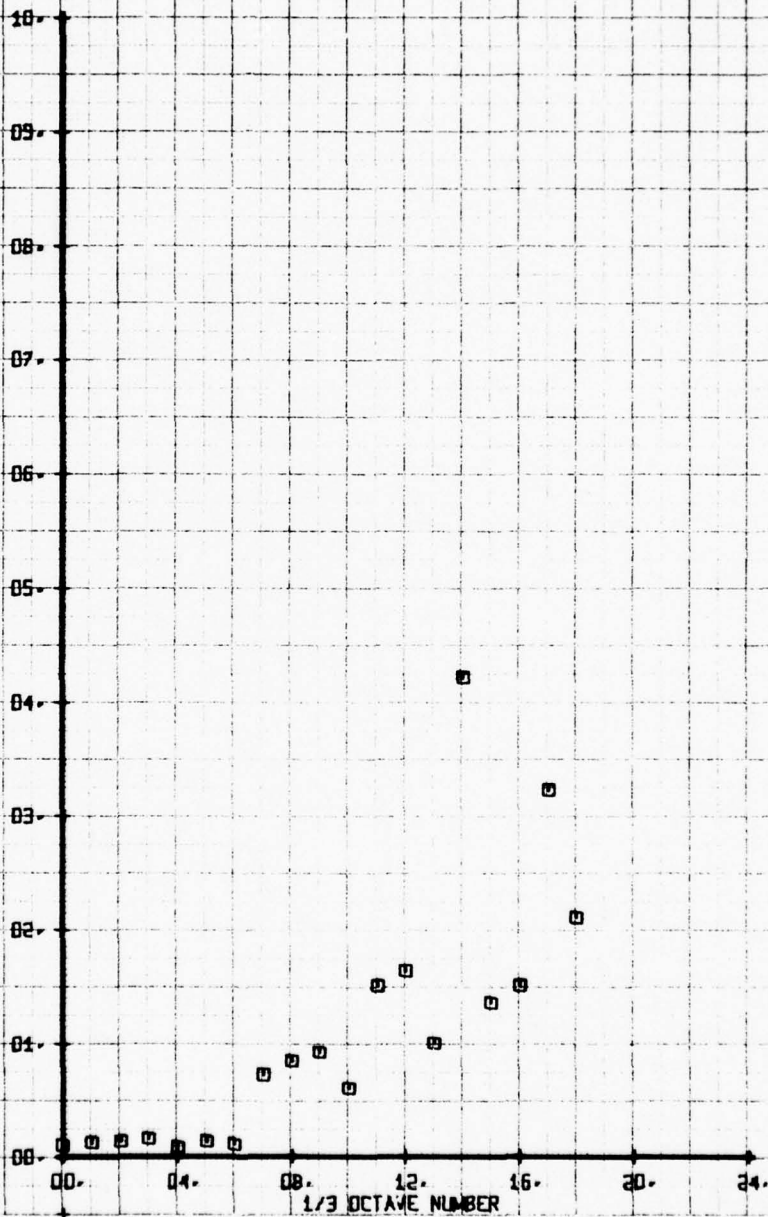
LATERAL FLOW ANGLE, BETA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. RUB CYRS GLASS ERISBEF 160  
 RUN 183 TP 7

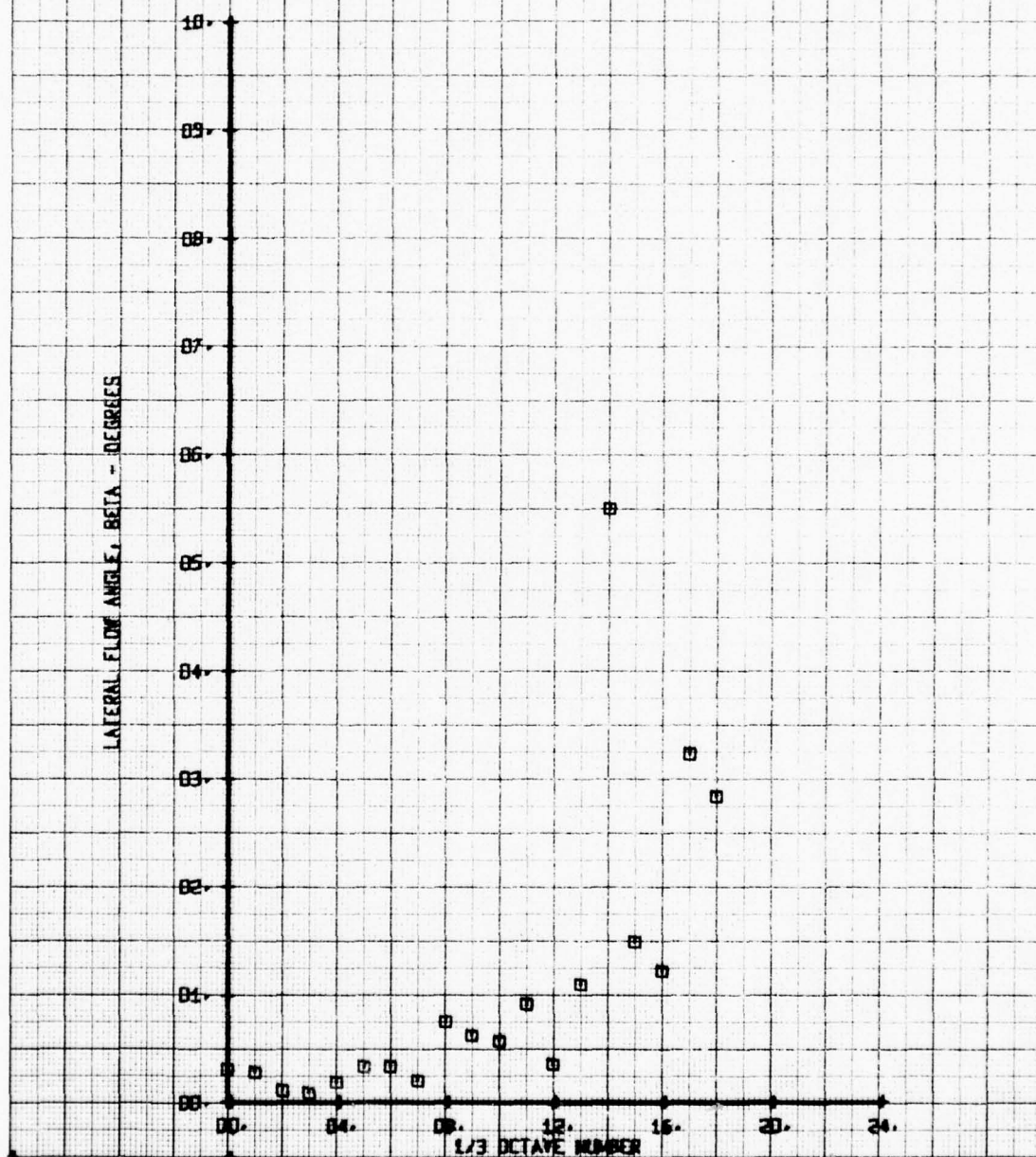
SVM	CH	LEGEND
0	65	PARAMETER BETA

LATERAL FLOW ANGLE, BETA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS GLASS FRISBEE 180  
 RUN 183 TP B

SYM	CH	PARAMETER
□	65	BETA



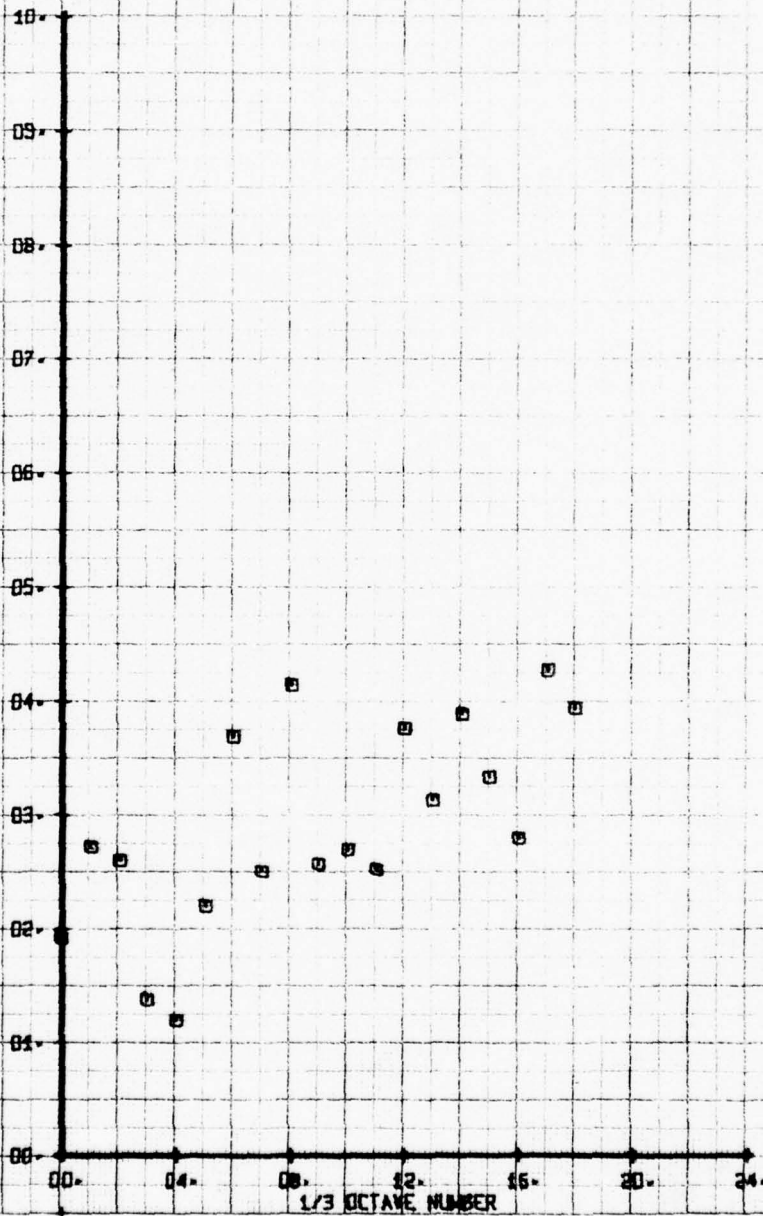
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS GLASS FRISBEE 160  
 RUN 183 TP 4

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

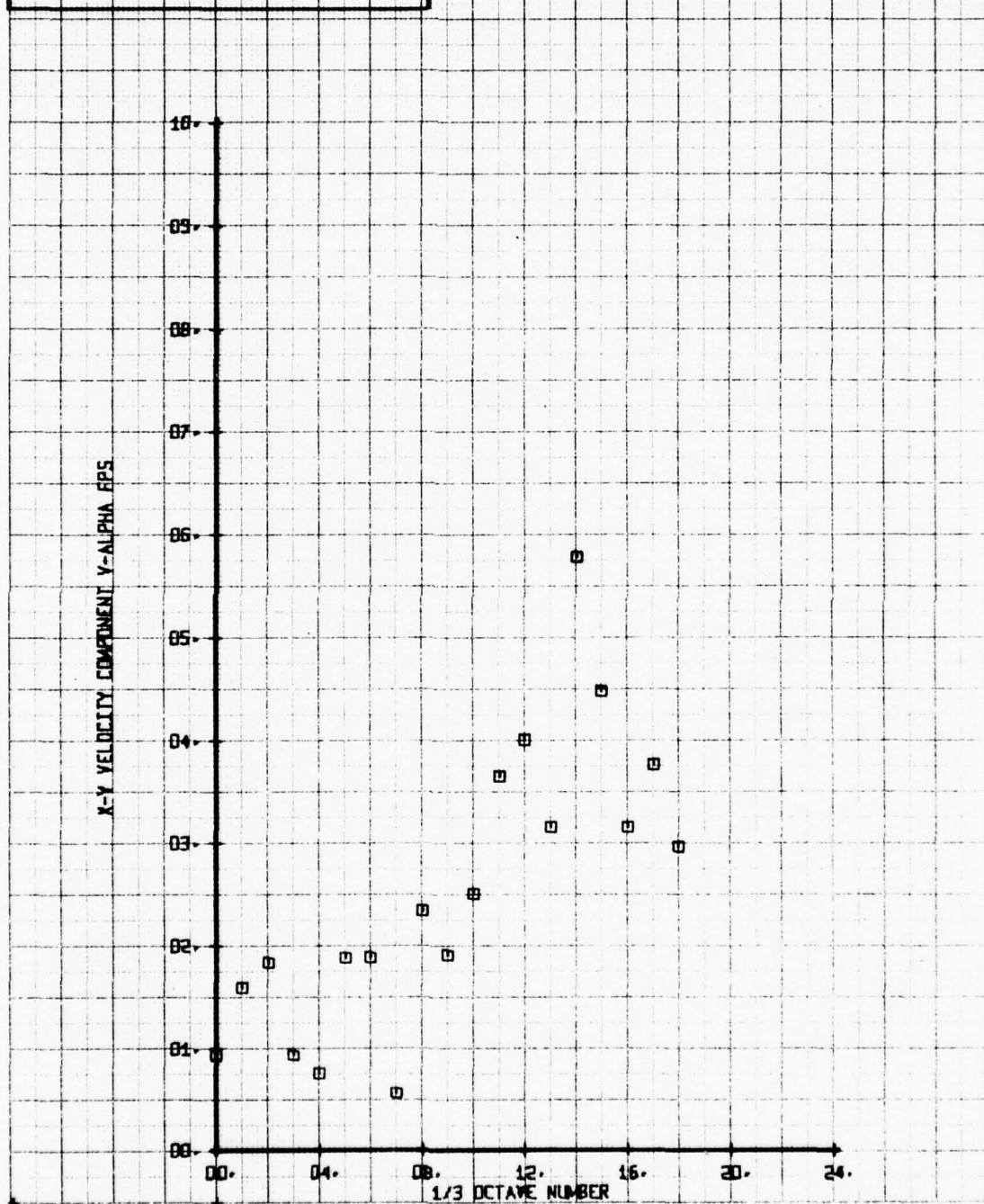
X-Y VELOCITY COMPONENT V-ALPHA FPS





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. MIA CYRS GLASS FRISBEE 160  
 RUN 183 TP 5

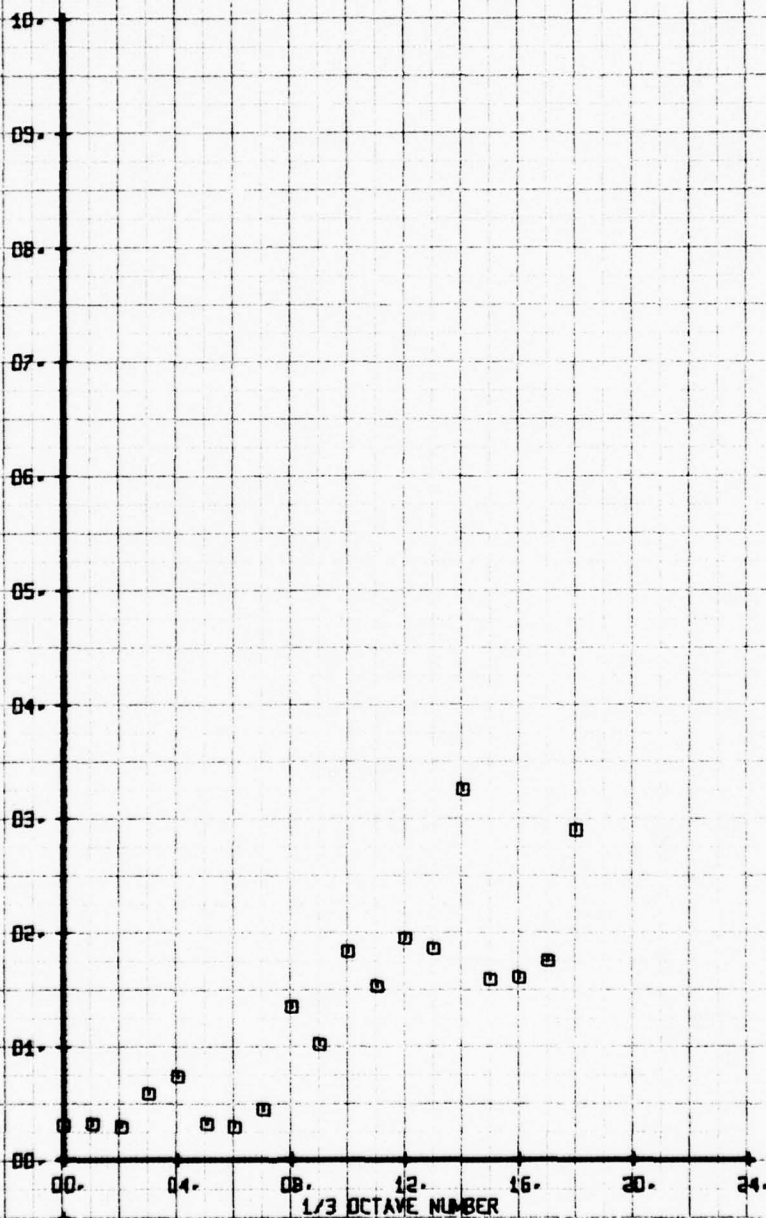
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 CH 66  
 PARAMETER  
 V-ALPHA



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
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 RUN 183 TP 6

LEGEND  
 SYM CH PARAMETER  
 O 66 V-ALPHA

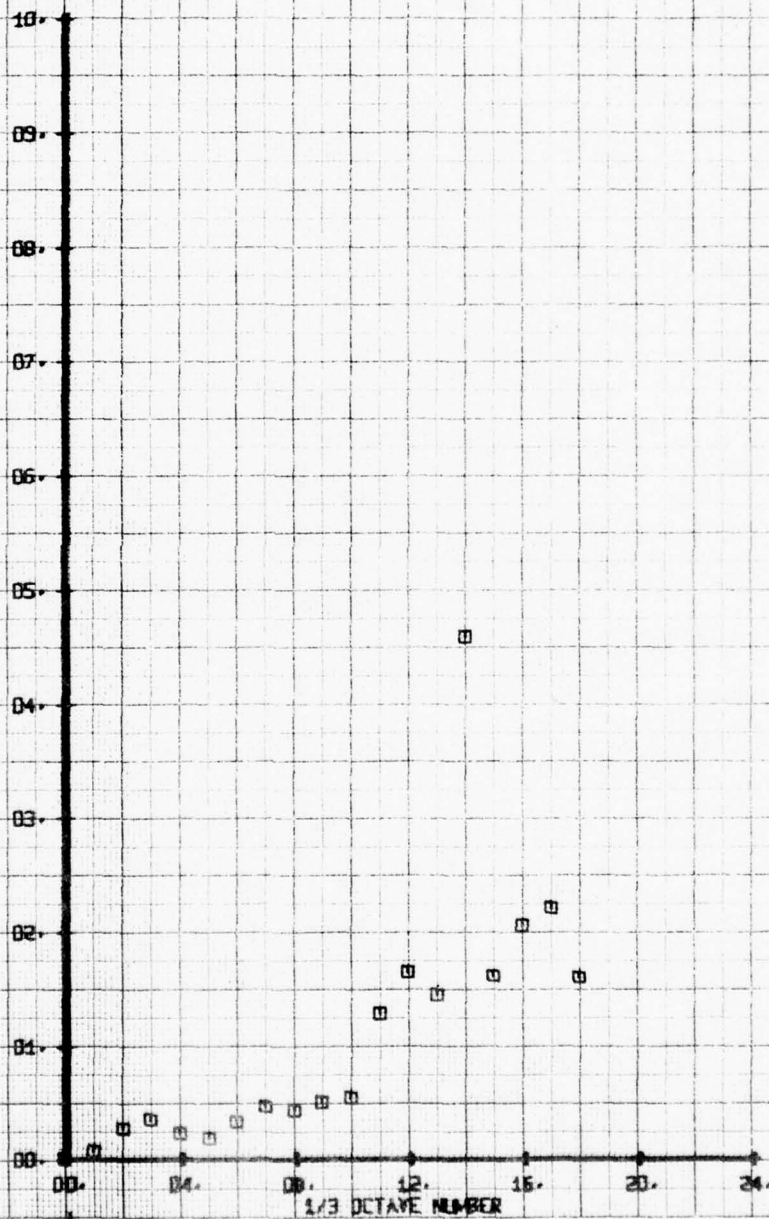
X-Y VELOCITY COMPONENT V-ALPHA EPS



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CYRS GLASS FRISBEE 160  
 RUN 183 TP 7

LEGEND	
SYM	CH
□	66
PARAMETER	
V-ALPHA	

X-Y VELOCITY COMPONENT V-ALPHA FPS



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
MISC. HUB CYRS GLASS FRISBEE 160  
RUN 183 TP B

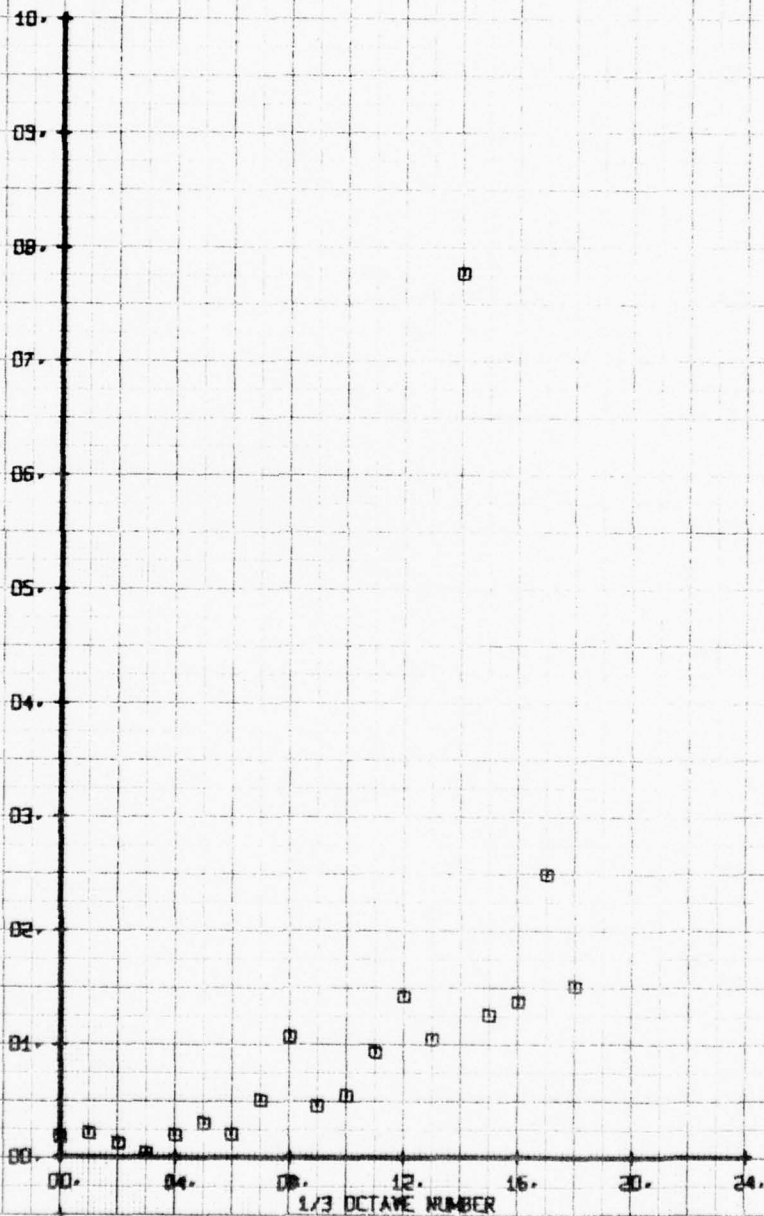
SYM  
□

CH  
66

LEGEND

PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS

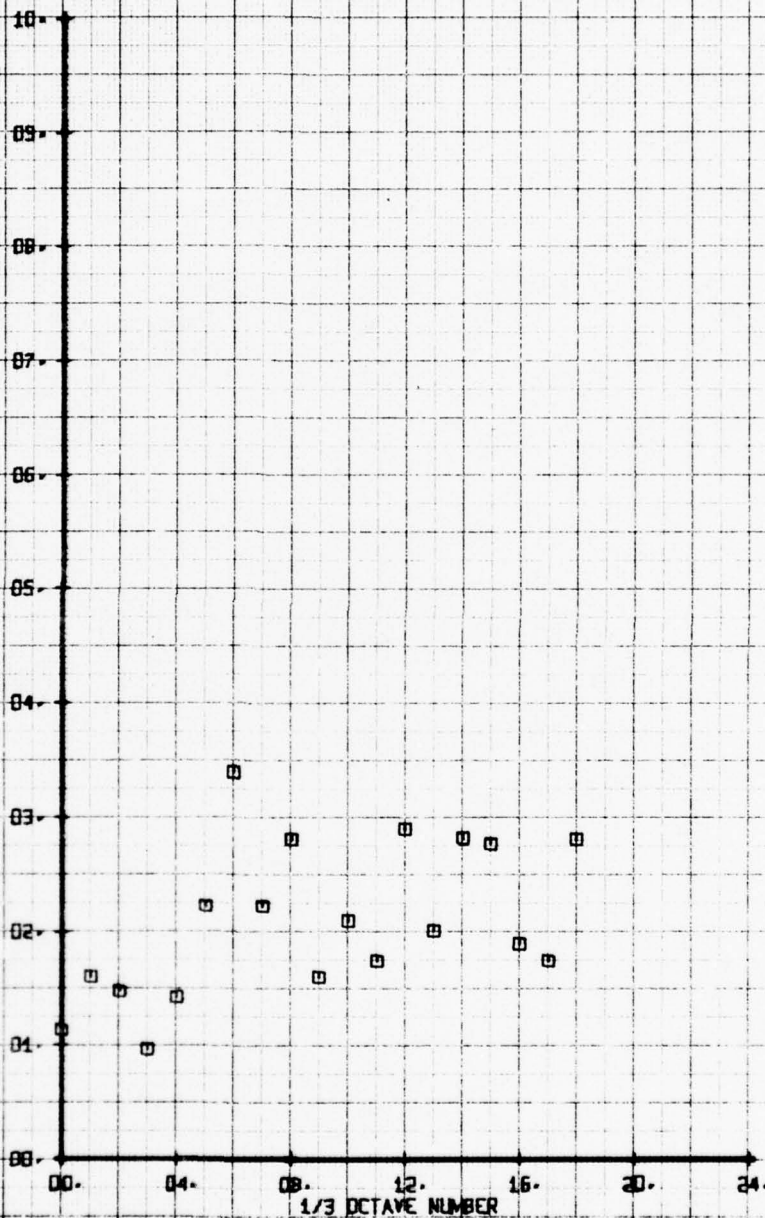




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. NUM CYRS GLASS FRISBEE 160  
 RUN 183 TP 4

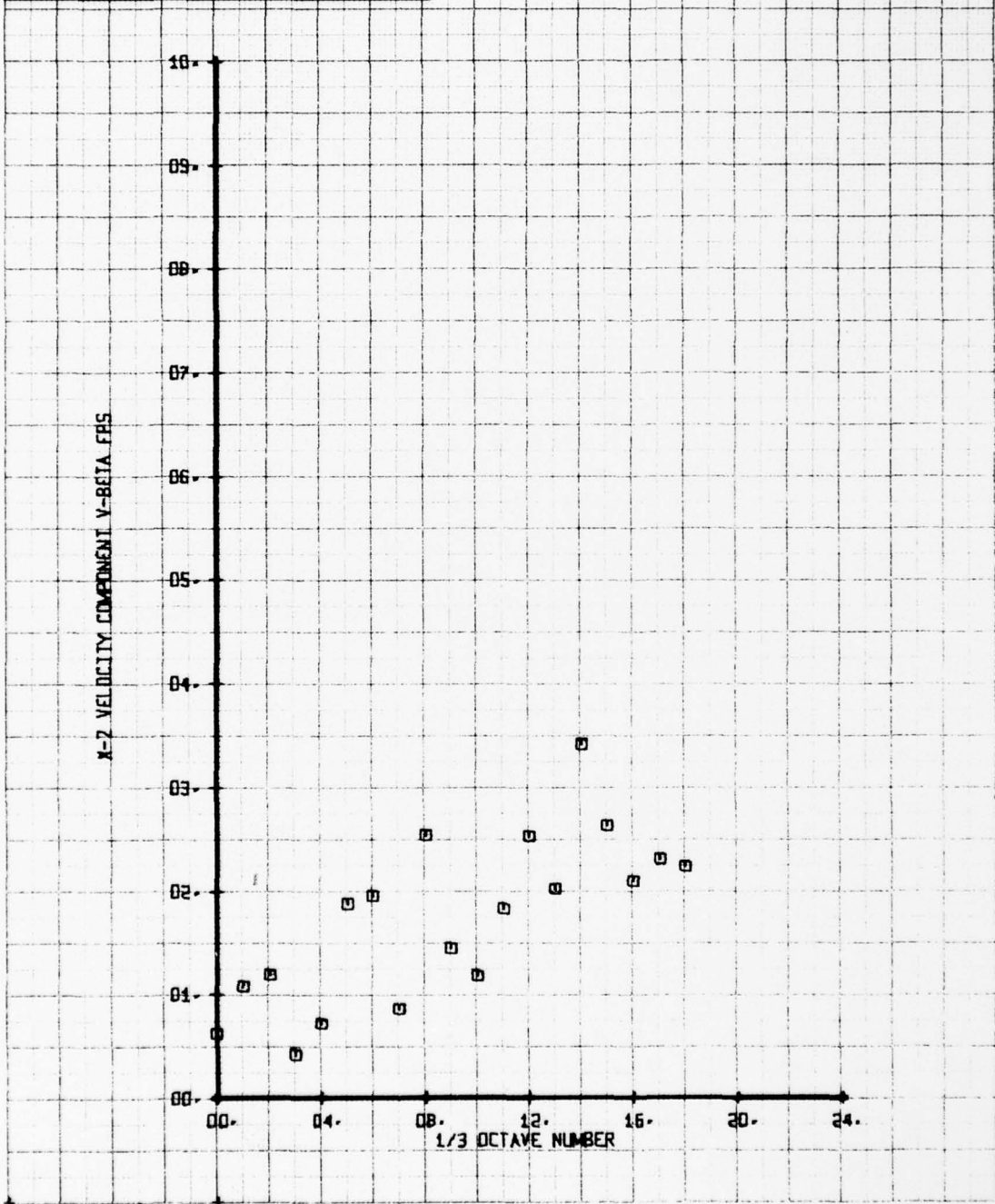
SYM	CH	PARAMETER
□	65	V-BETA

X-2 VELOCITY COMPONENT V-BETA FFS



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS GLASS FRISBEE 160  
 RUN 183 TP 5

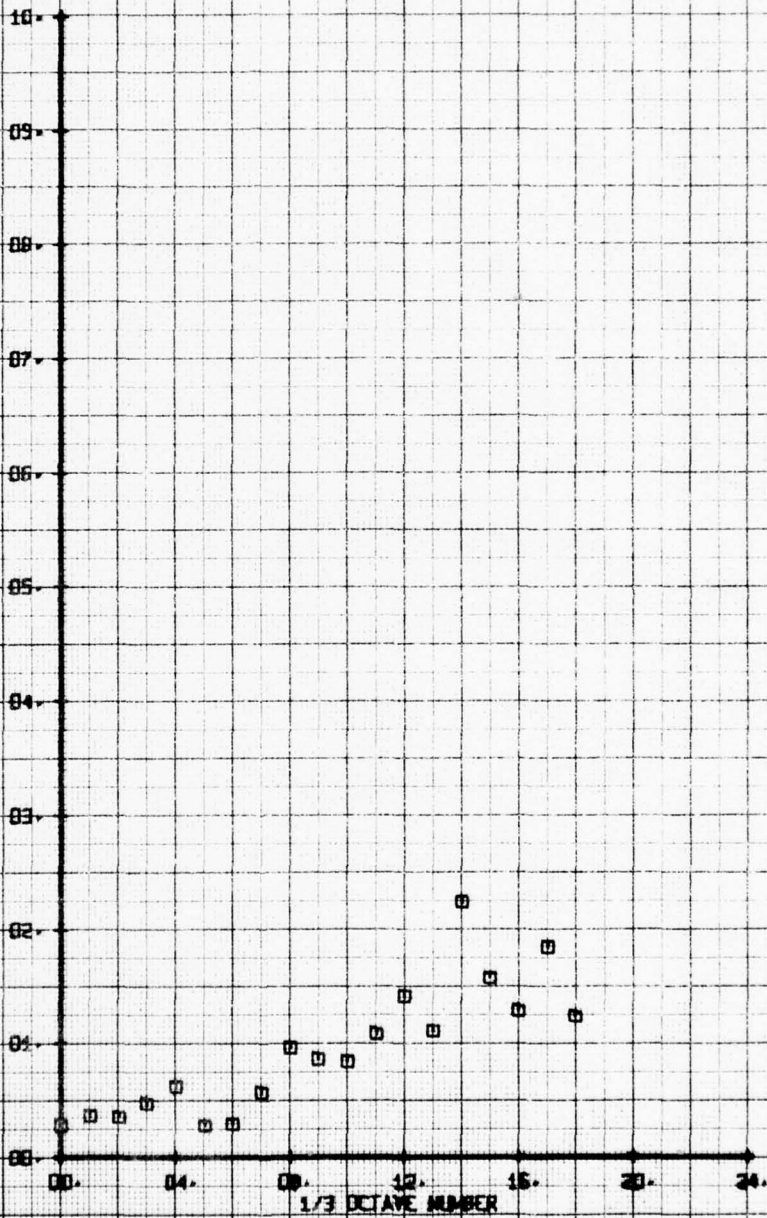
LEGEND  
 SYM CH PARAMETER  
 O 65 V-BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 MISC. HUB DYRS GLASS FRISBEE 160  
 RUN 183 IP 6

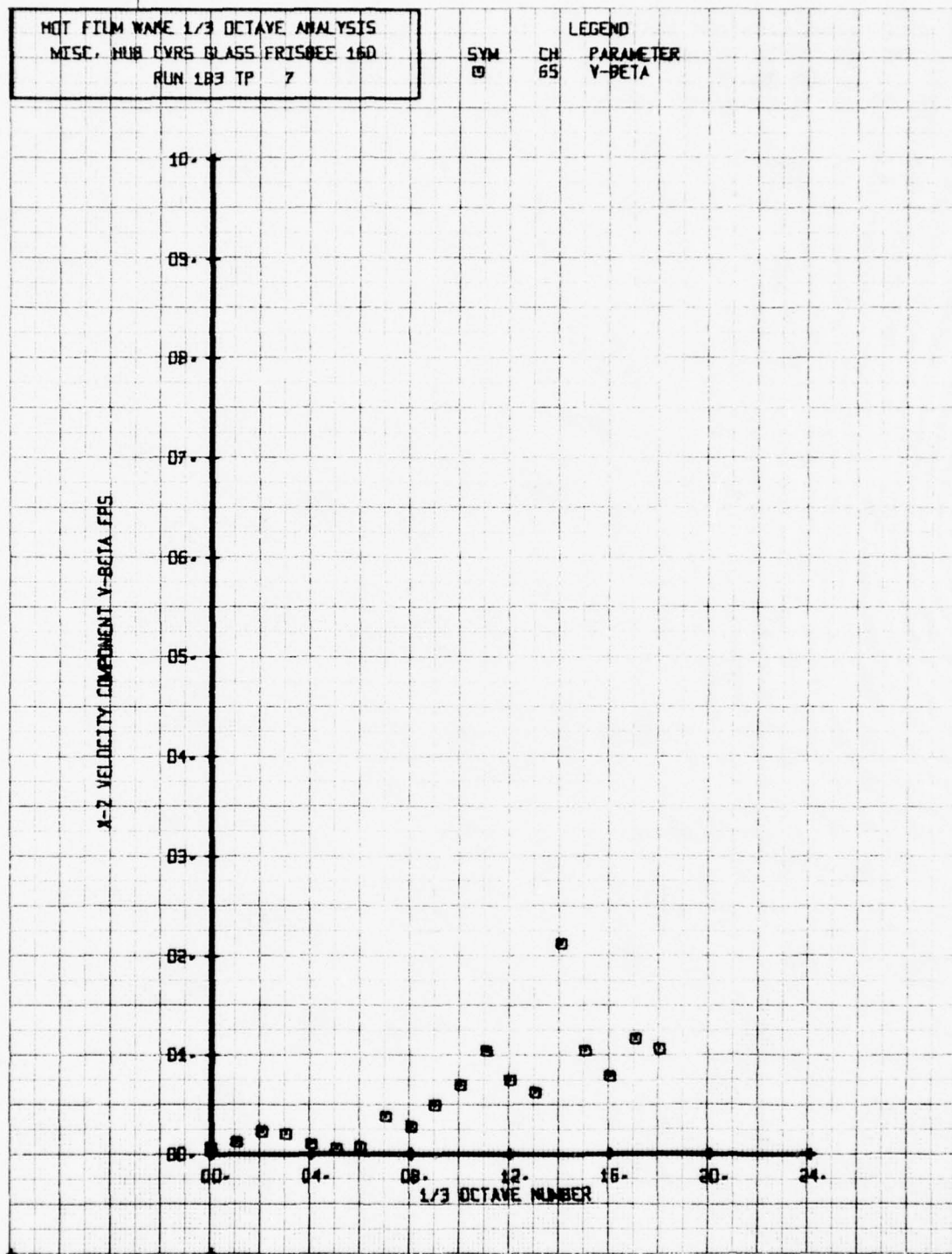
LEGEND  
 CH 65  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS

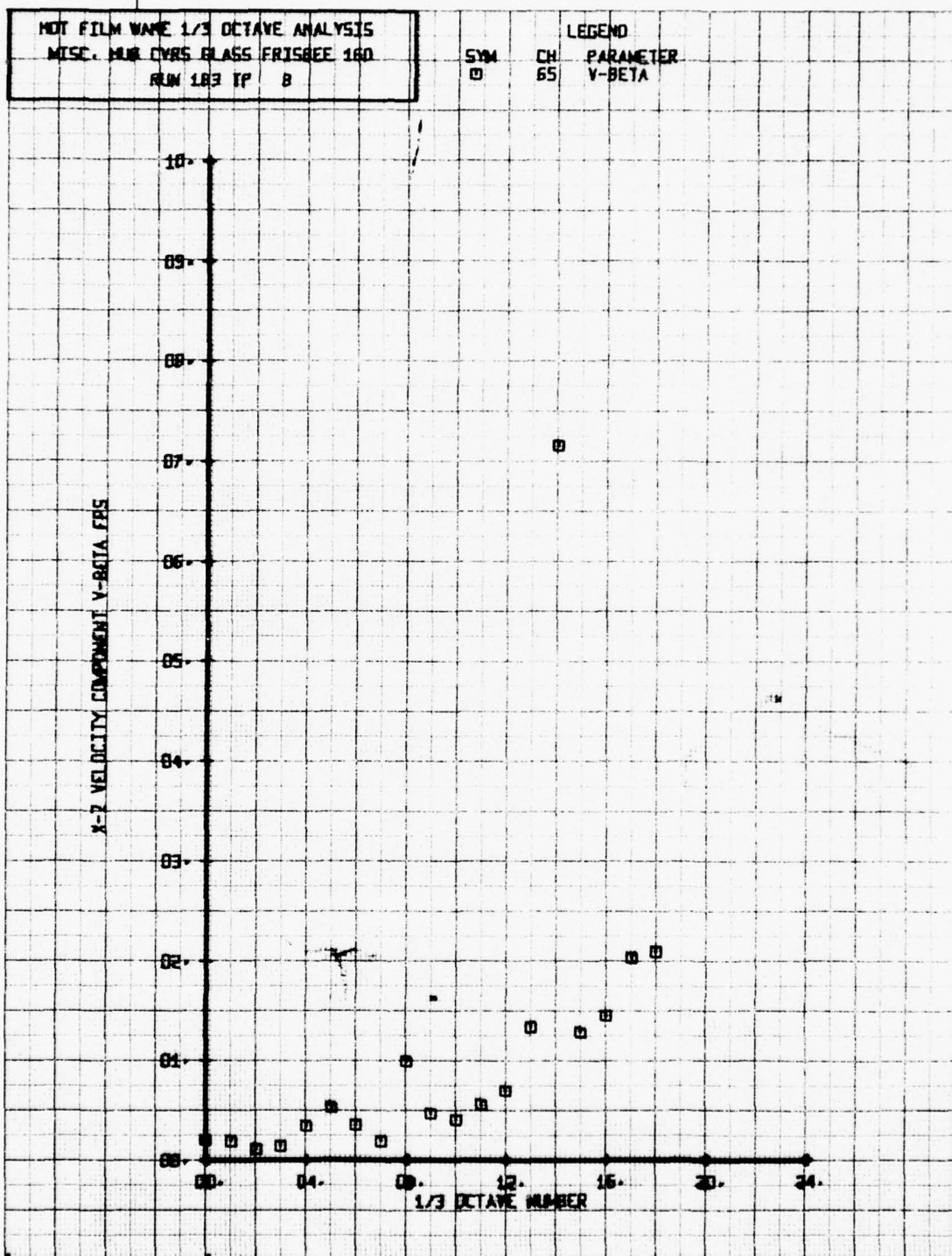


MOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 MISC. HUB CVRS GLASS FRISBEE 160  
 RUN 183 TP 7

LEGEND  
 SYM CH PARAMETER  
 □ 65 Y-BETA

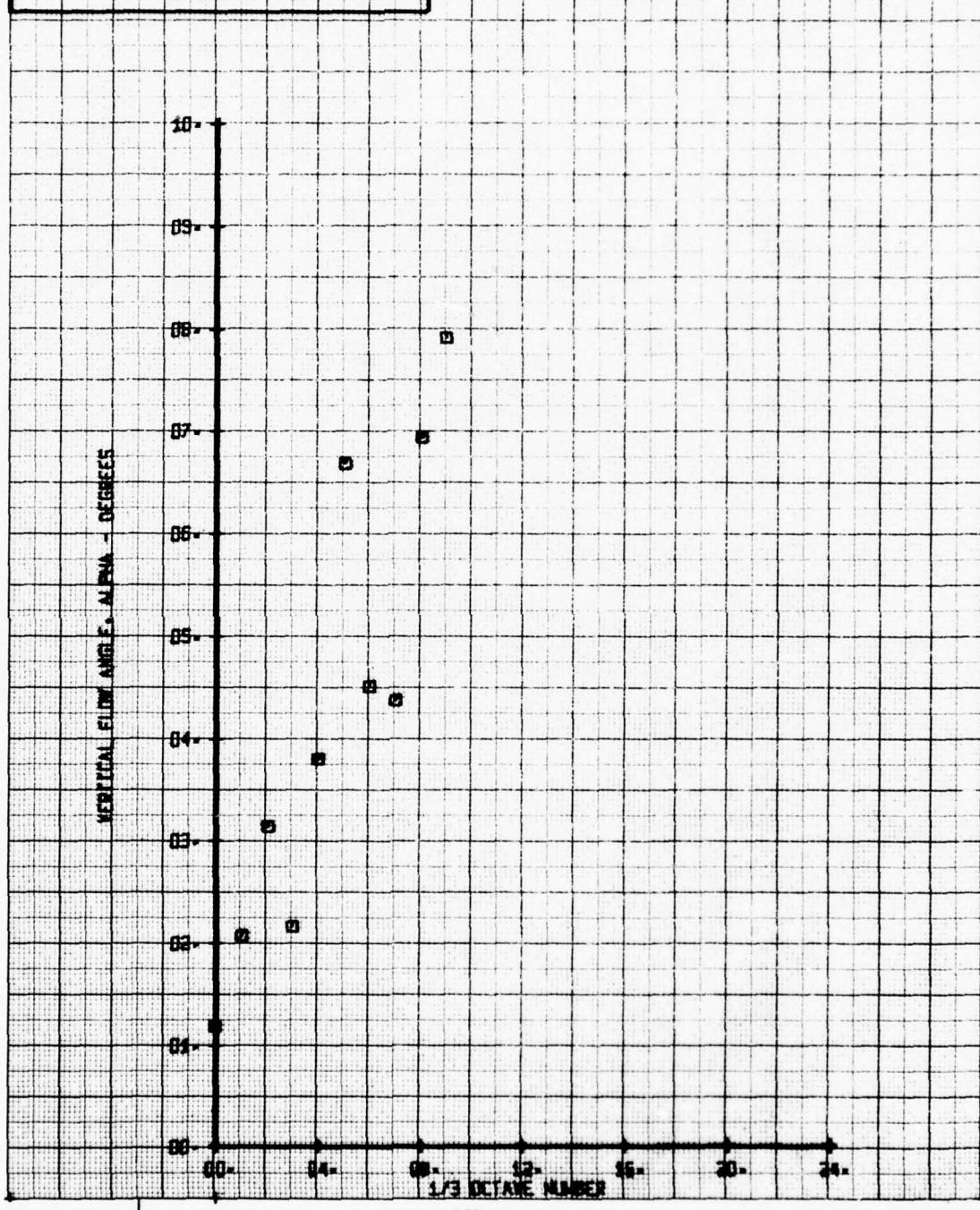






HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF ATR EJECT BASIC SYS NO 010  
RUN 172 TP 3

SYM CH LEGEND  
0 66 PARAMETER  
ALPHA



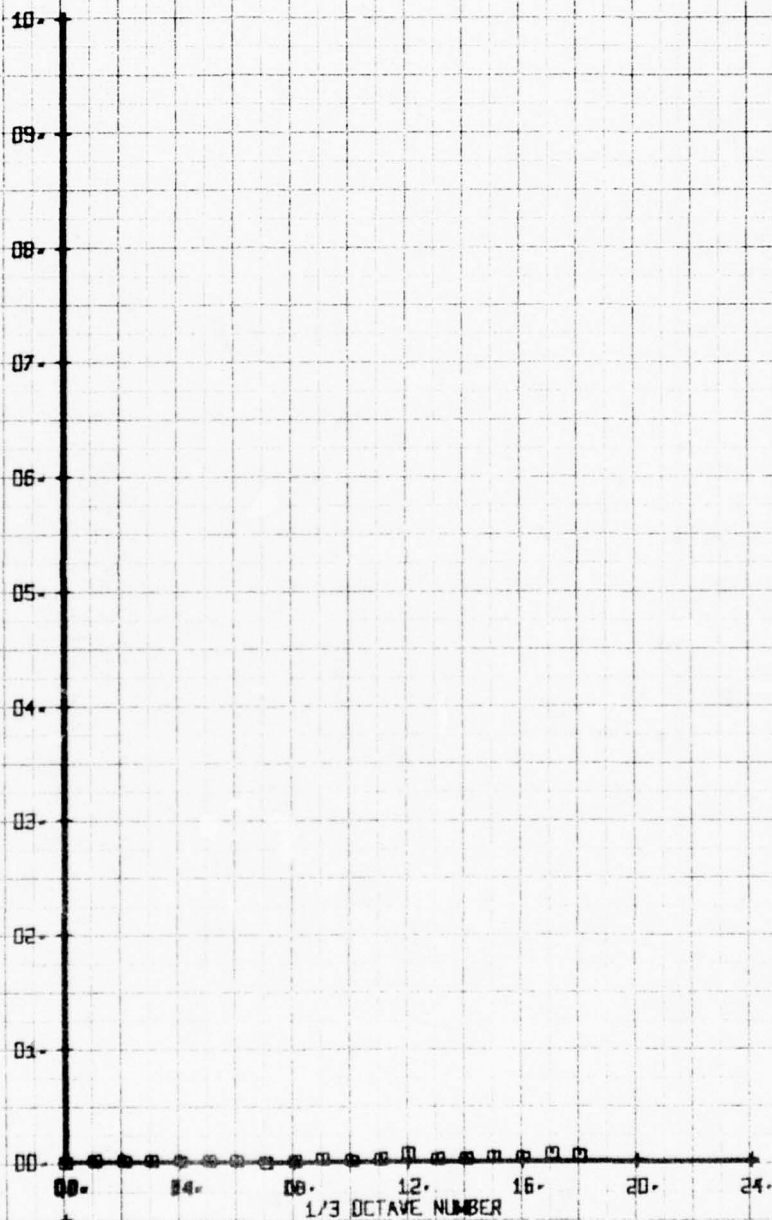
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO BLD  
RUN 172 TP 4

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

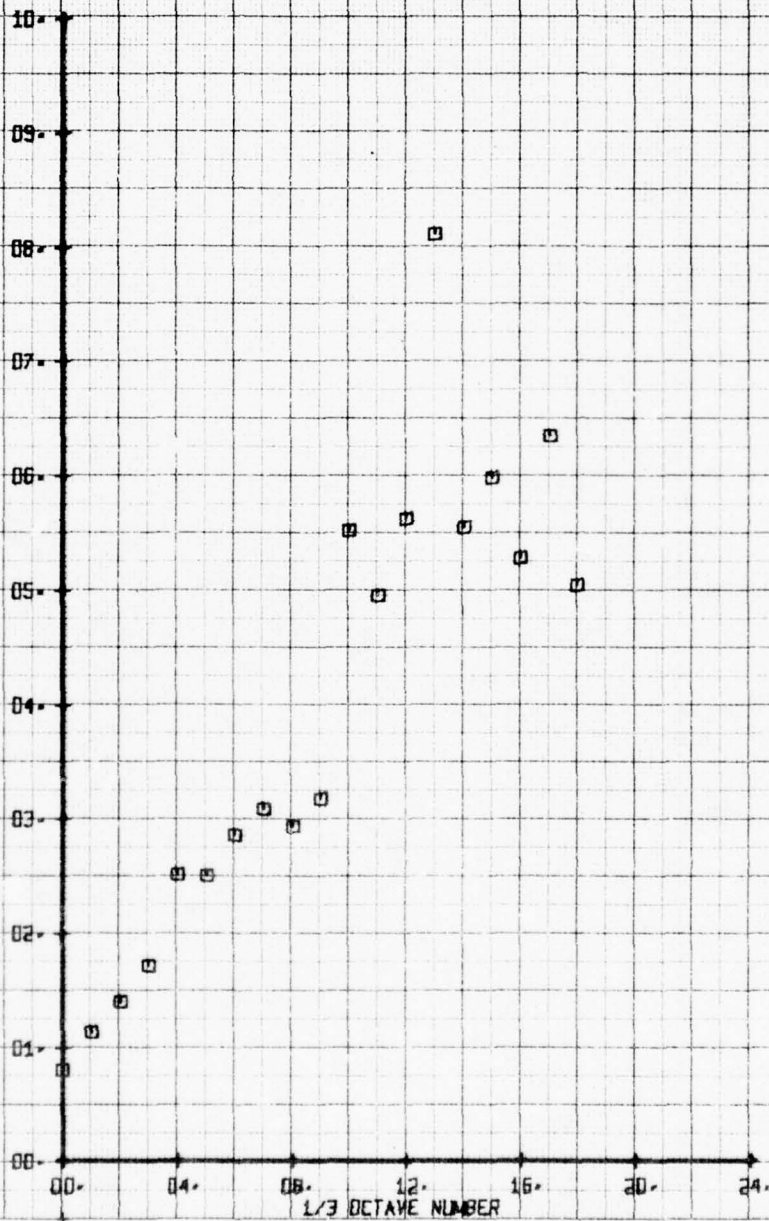
VERTICAL FLOW ANGLE, ALPHA - DEGREES



NET FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR E-RT BASIC SYS NO 813  
RUN 172 TP 5

SYM CH  
□ 66  
LEGEND  
PARAMETER  
ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



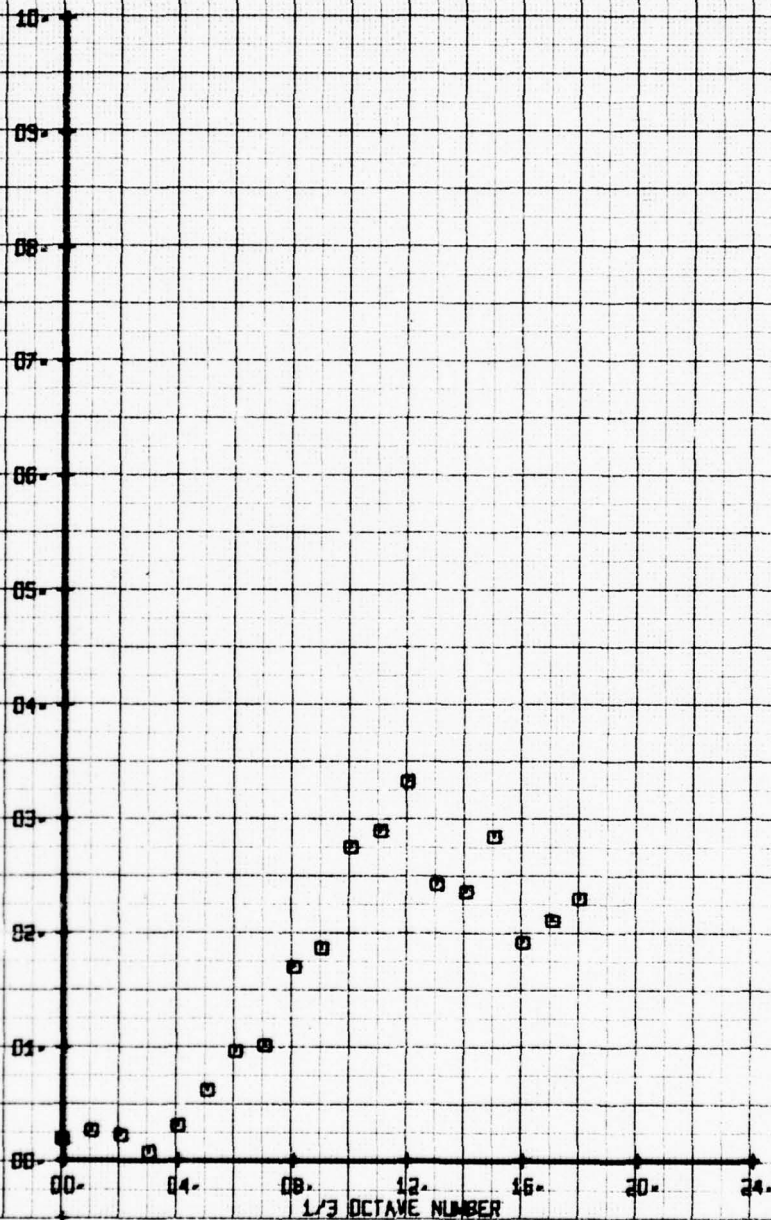


NET FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EXIT BASIC SYS NO 3LB  
RUN 172 TP 7

CH  
65

LEGEND  
PARAMETER  
ALPHA

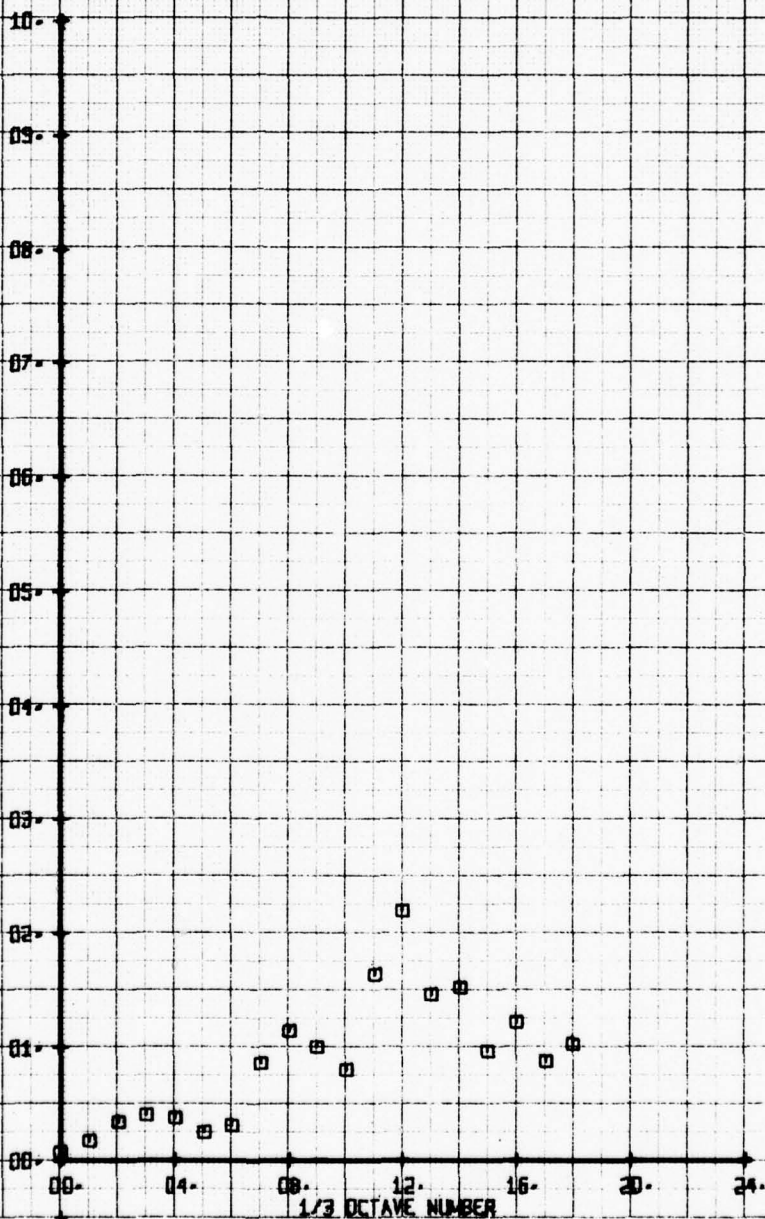
VERTICAL FLOW ANGLE, ALPHA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC 5% NO BLD  
RUN 172 TP 9

LEGEND	
SYM	CH
□	56
	PARAMETER
	ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



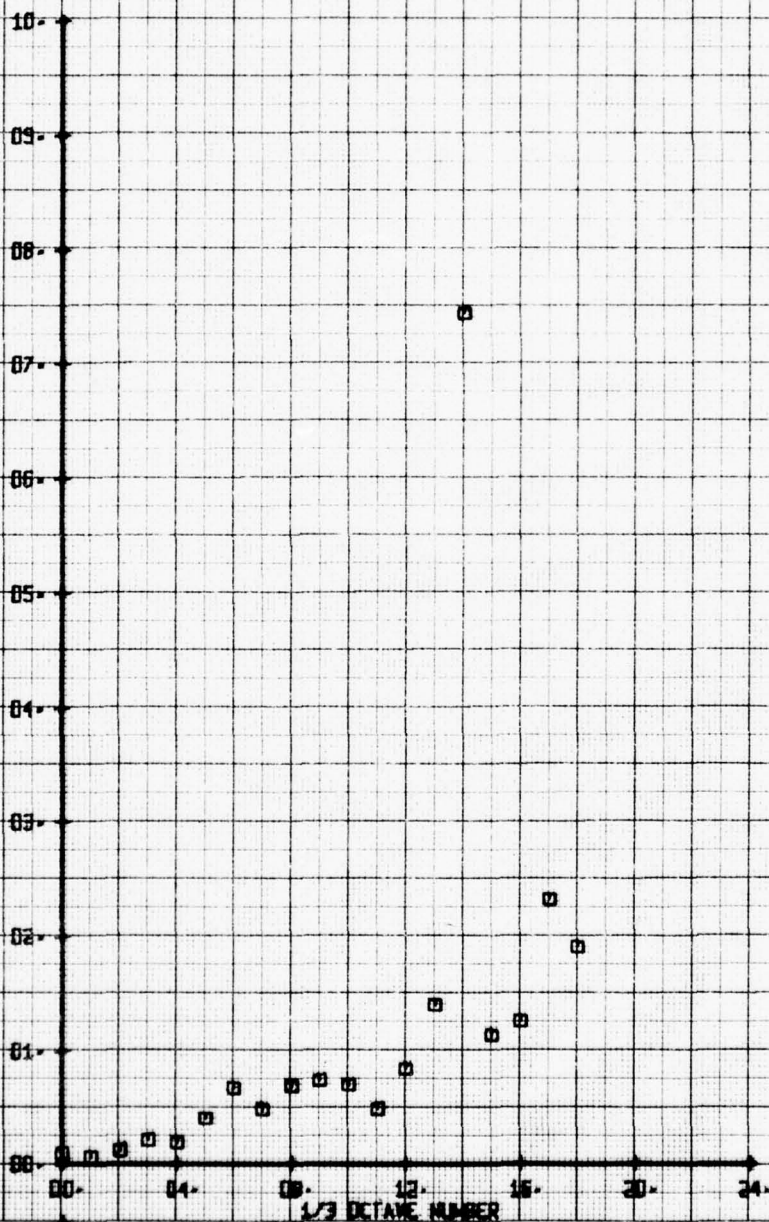
HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO BLD  
RUN 172 TP 9

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES





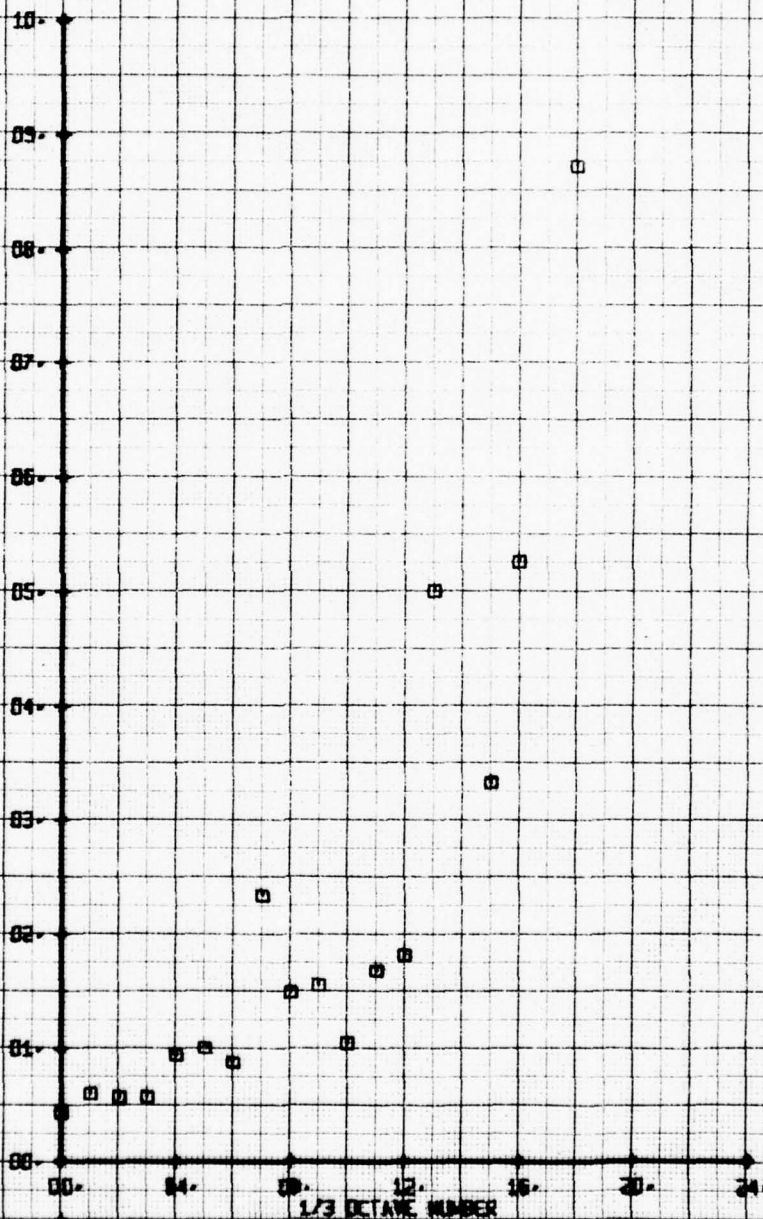
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
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RUN 172 TP 10

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

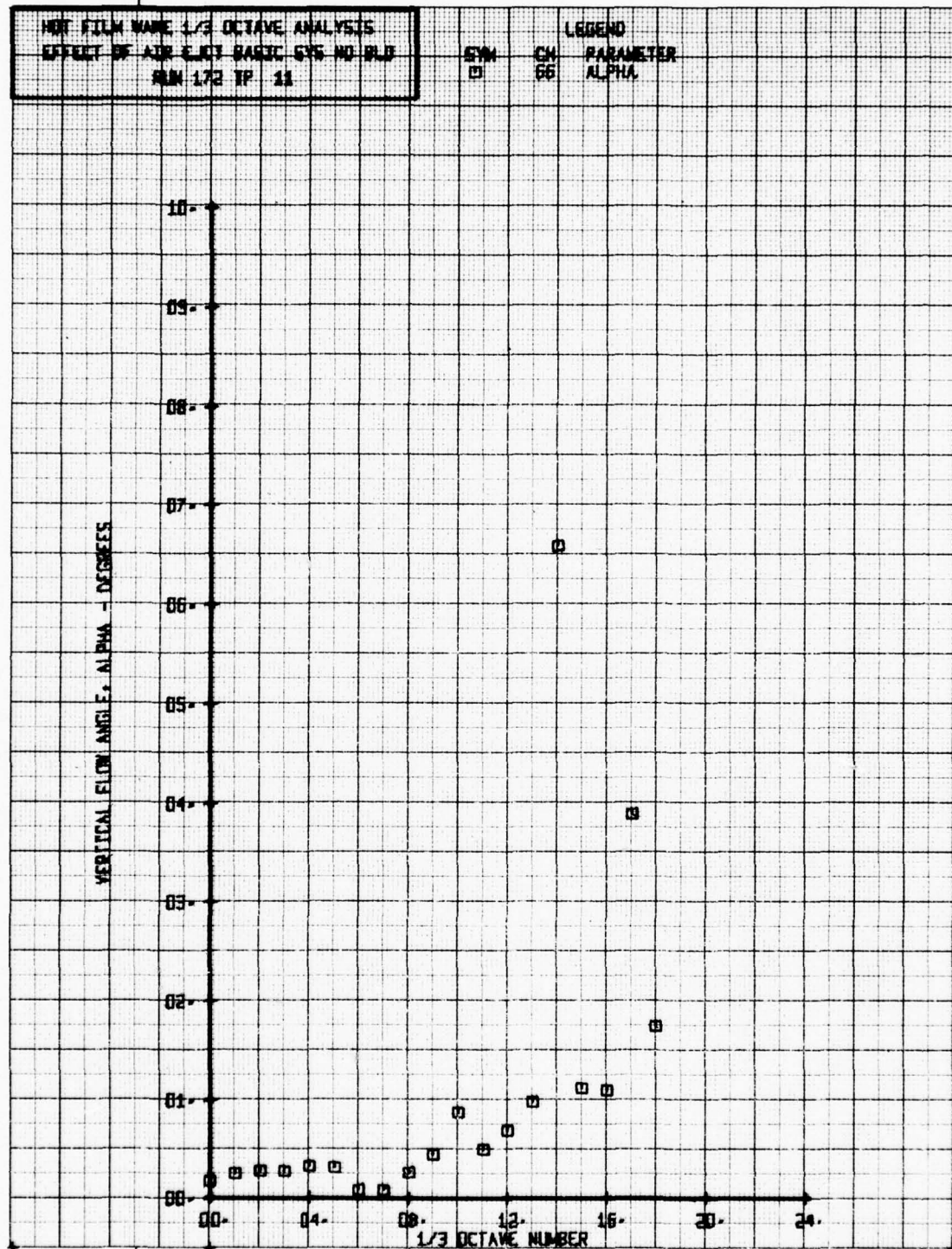
VERTICAL FLUX ANGLE, ALPHA - DEGREES





NET FILM NAME 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 910  
RUN 172 TP 11

SYN CH  
□ 66  
LEGEND  
PARAMETER  
ALPHA



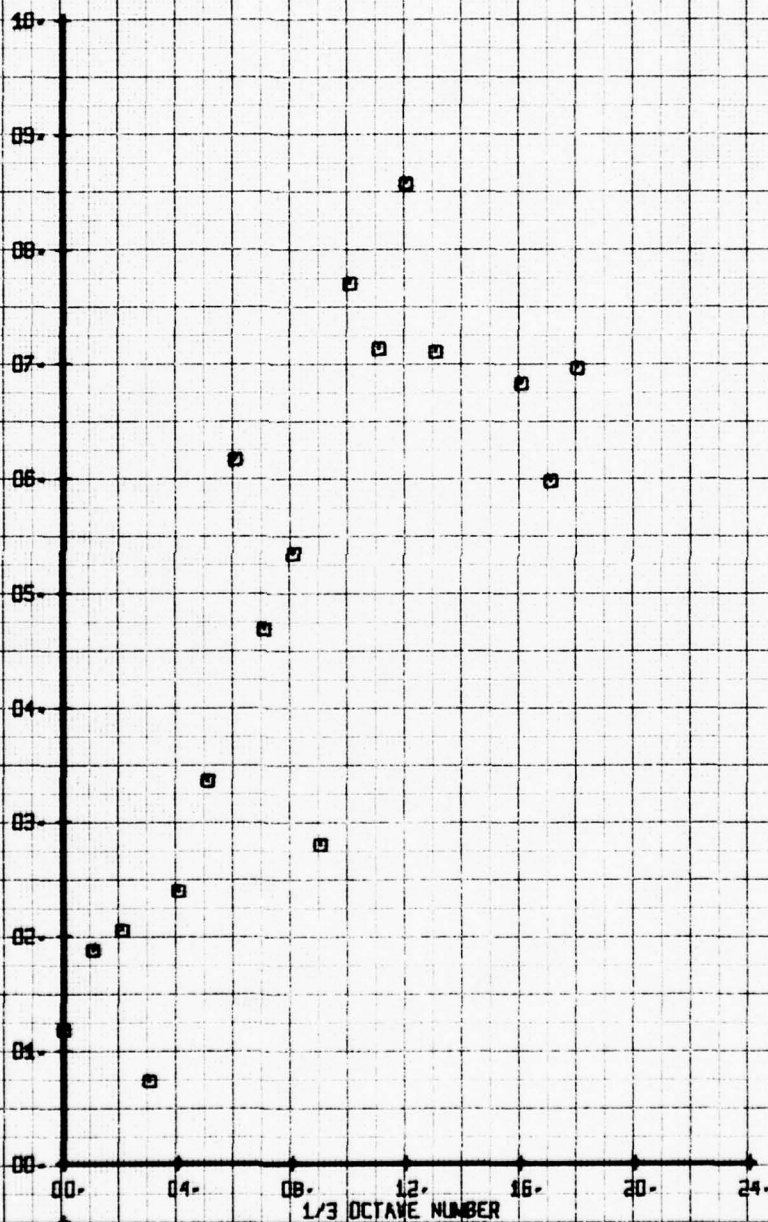
NOT FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR FLOW BASIC SYS NO. 811  
RUN 172 TP 3

SYM  
□

CH  
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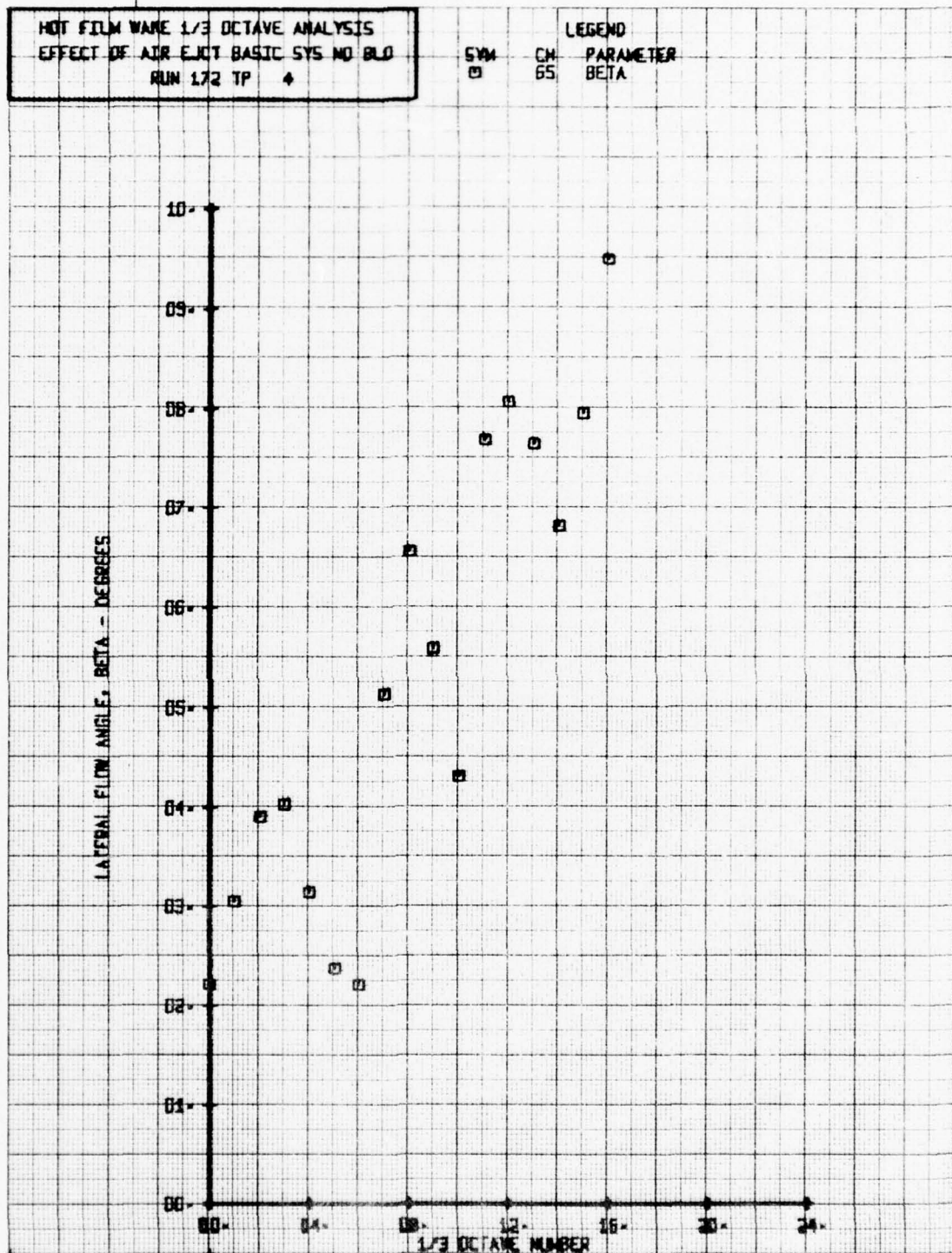
LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO BLD  
RUN 172 TP 4

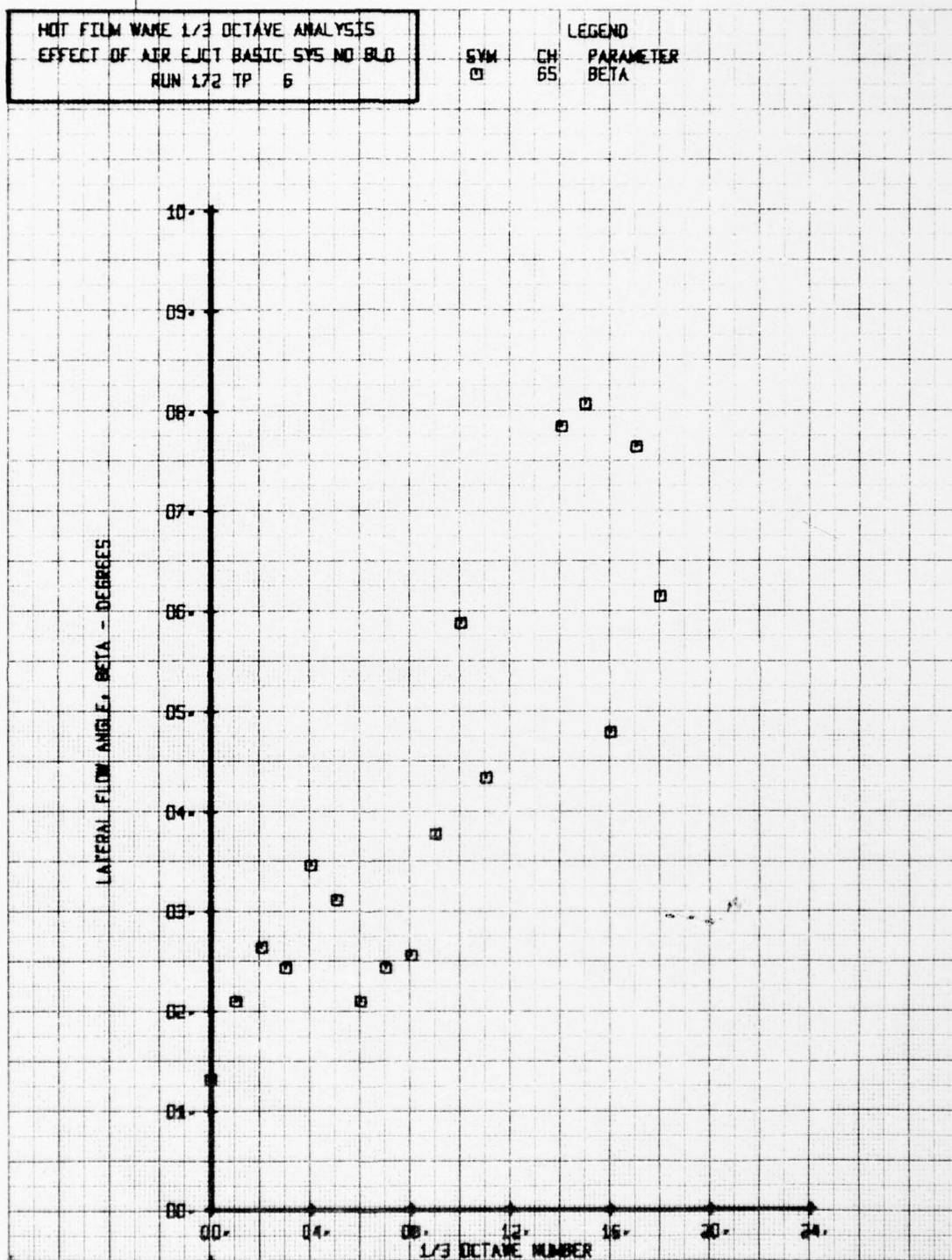
SYN CH  
□ 65  
LEGEND  
PARAMETER  
BETA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 810  
RUN 172 TP 6

SYN CH PARAMETER  
□ 65 BETA

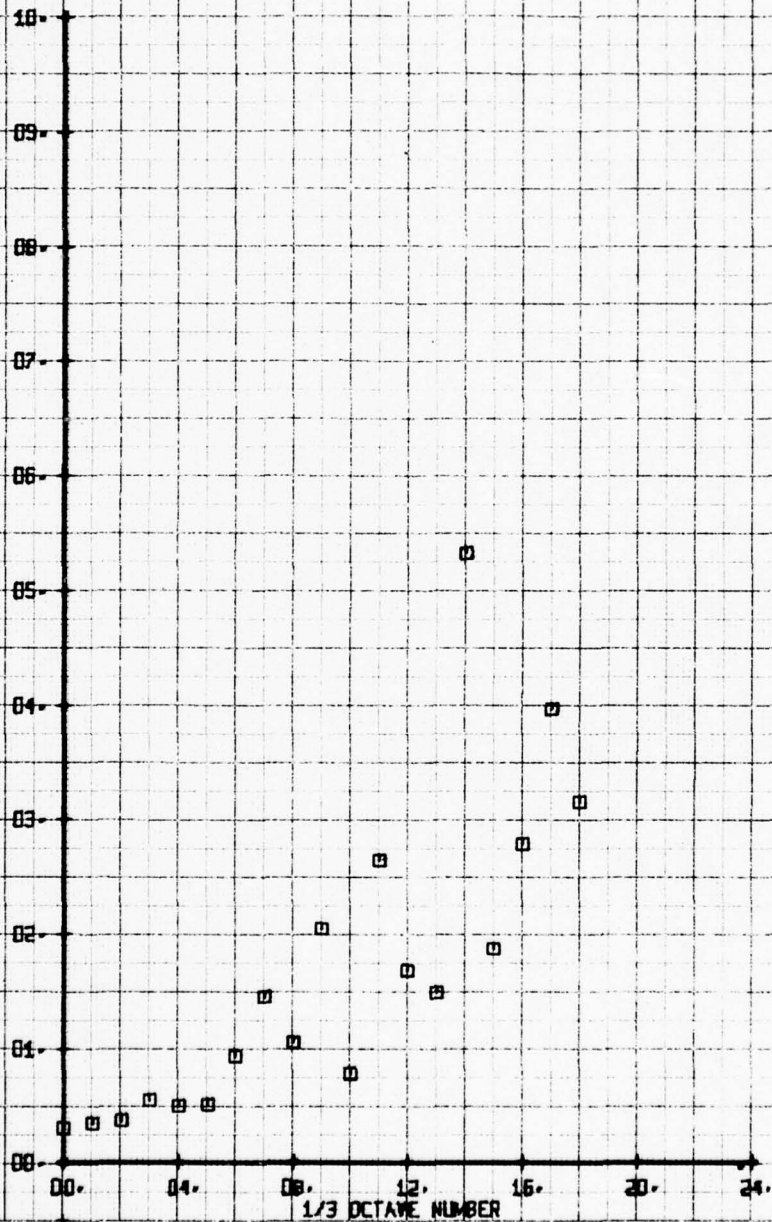




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 8LD  
RUN 172 TP 7

SYN CH  
□ 65  
LEGEND  
PARAMETER  
BETA

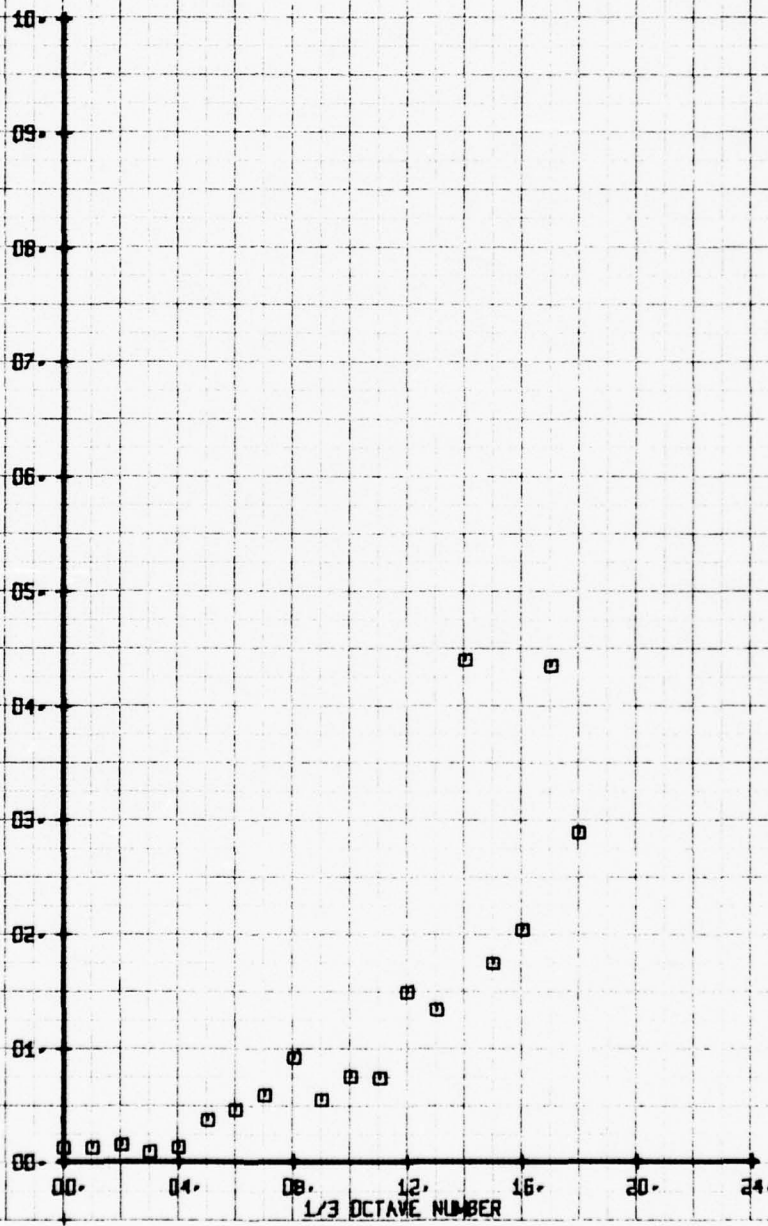
LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO BLD  
RUN 172 TP B

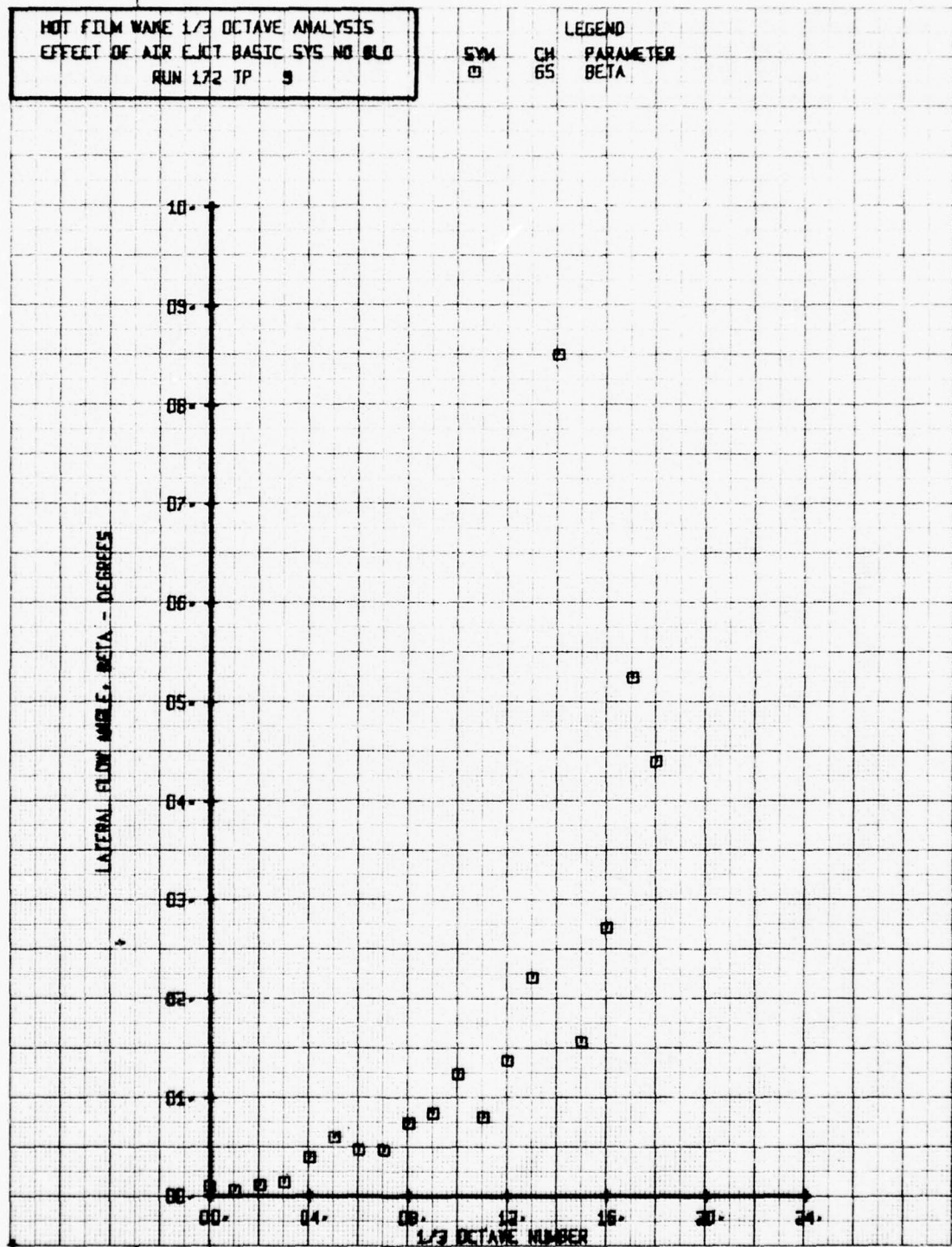
SYM	CH	LEGEND
□	65	PARAMETER BETA

LATERAL FLOW ANGLE, BETA - DEGREES



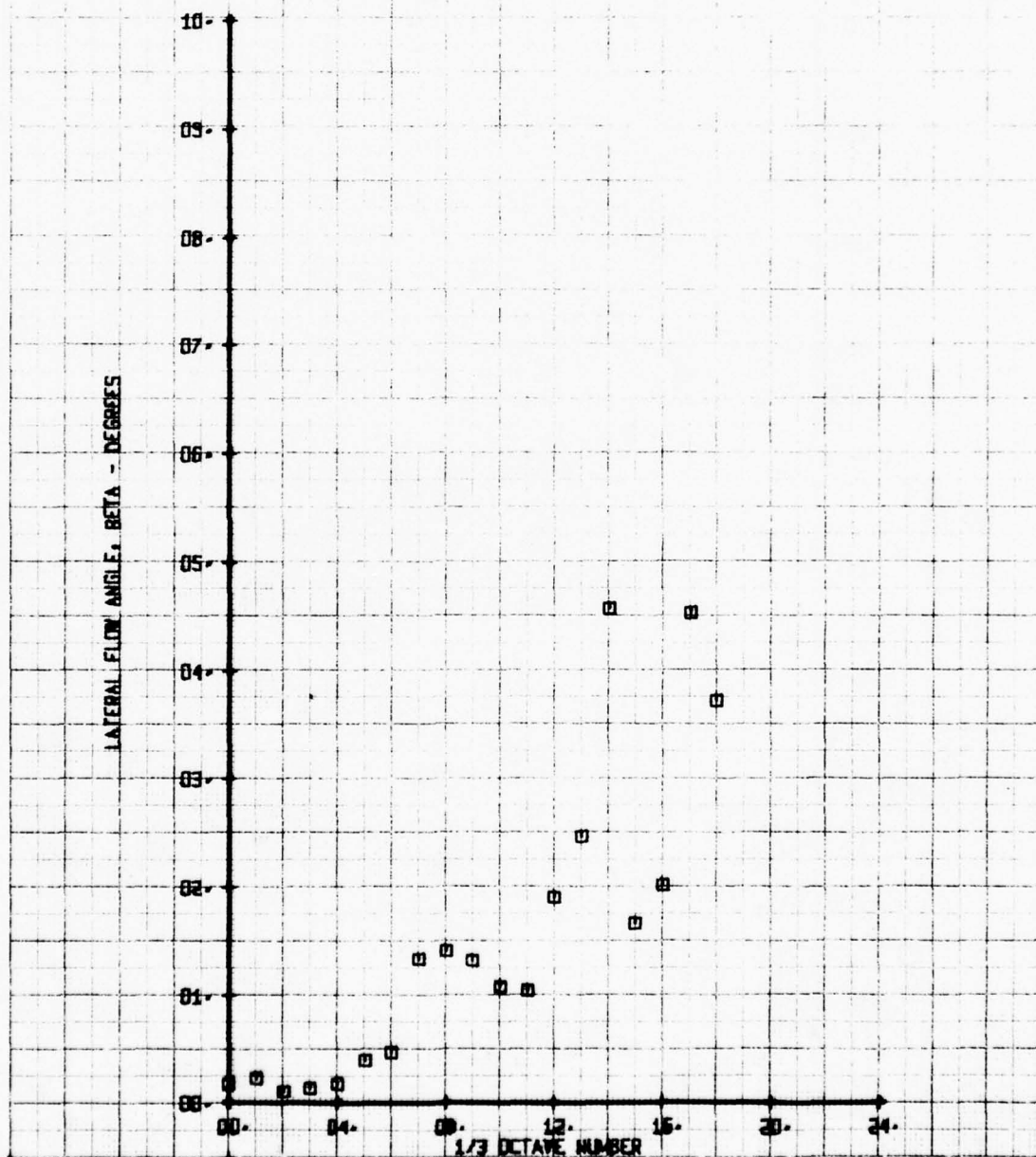
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 010  
RUN 172 TP 9

SYN CH PARAMETER  
0 65 BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO BLD  
RUN 172 TP 10

LEGEND  
SYM CM PARAMETER  
□ 65 BETA



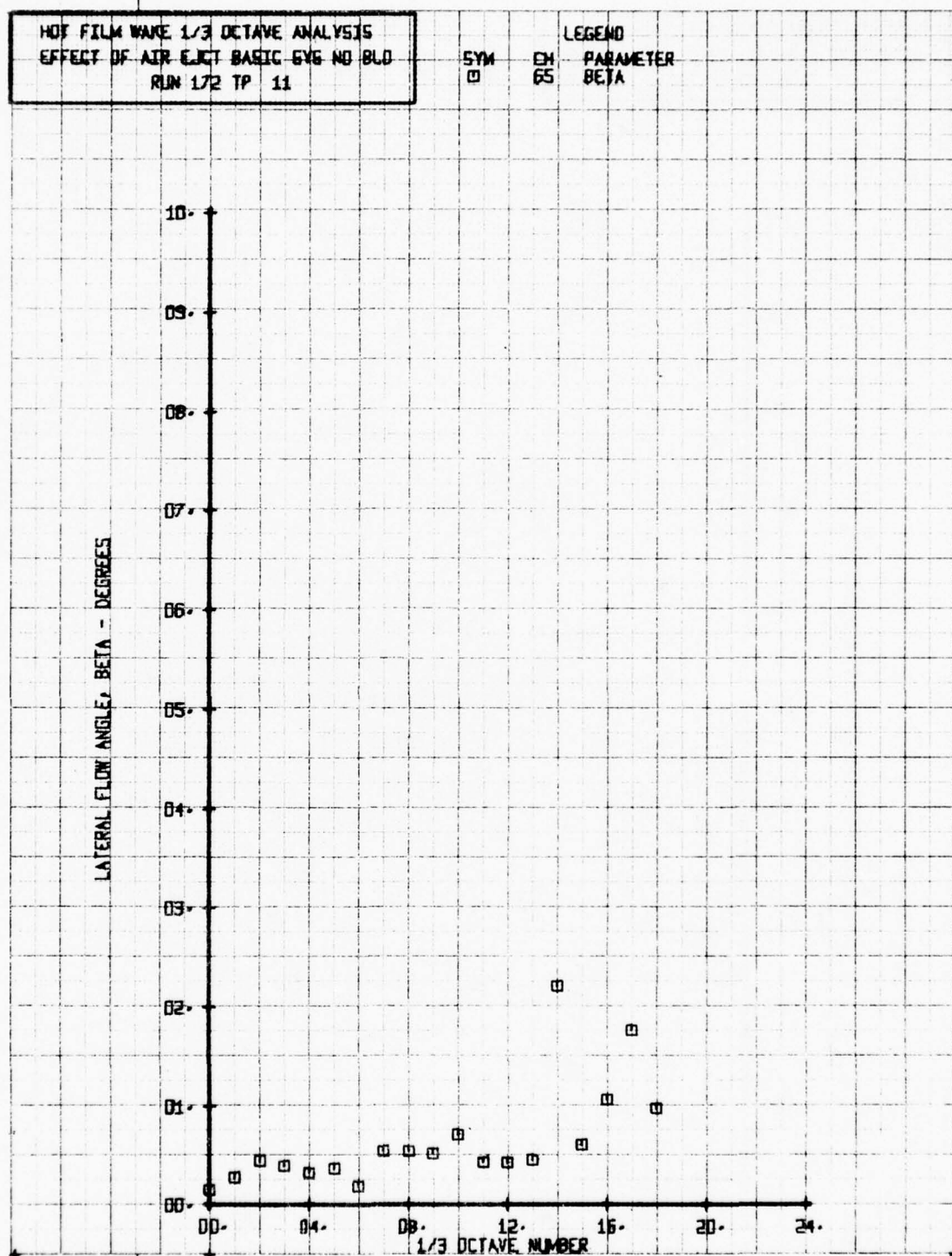


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC GYG NO 8LD  
RUN 172 TP 11

SYM  
□

EM  
65

LEGEND  
PARAMETER  
BETA



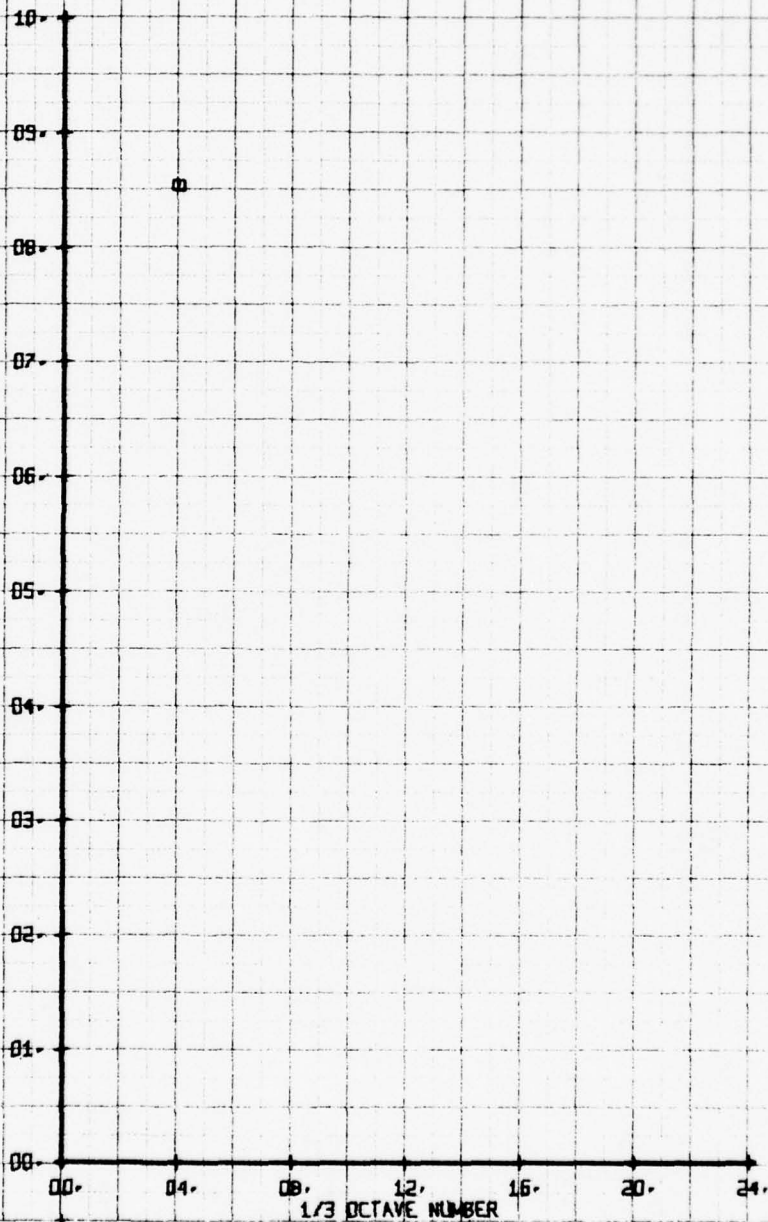
HOT FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 8LD  
RUN 172 TP 3

SYM  
□

CH  
66

LEGEND  
PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA GPS



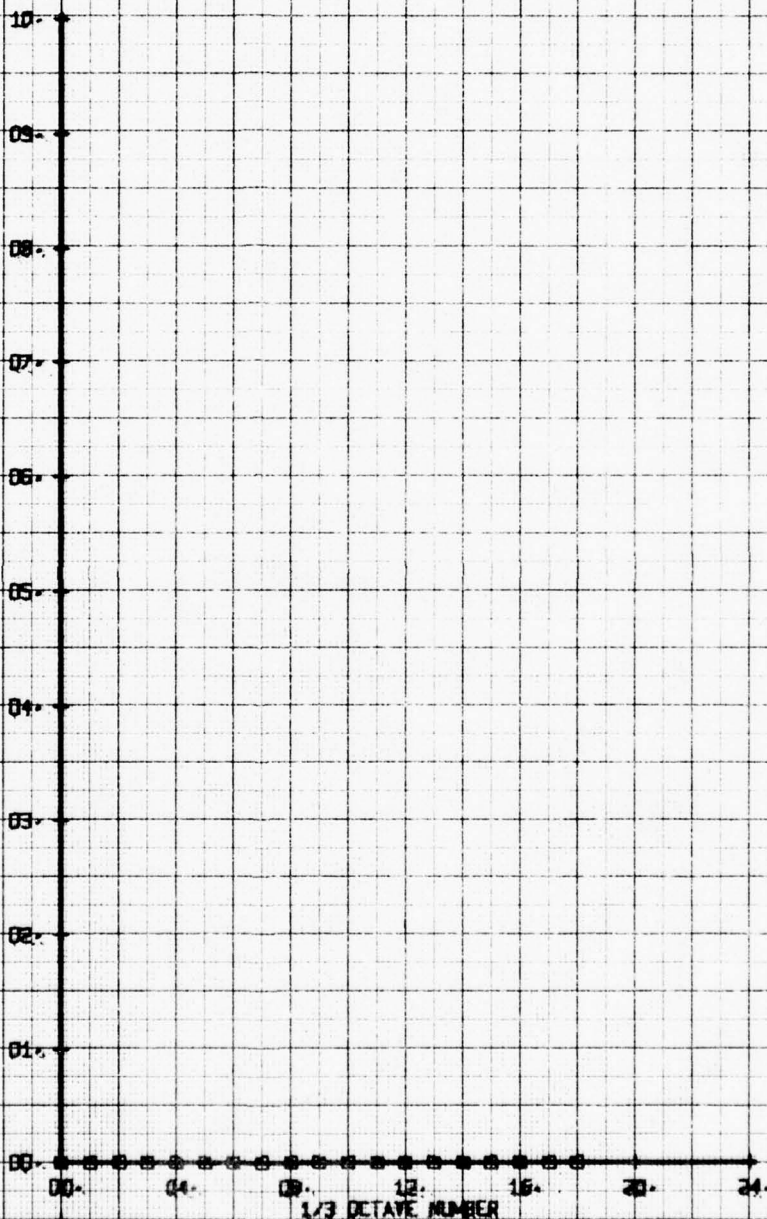
NOV FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 8LD  
RUN 172 TP 4

SYM  
0

CN  
66

LEGEND  
PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



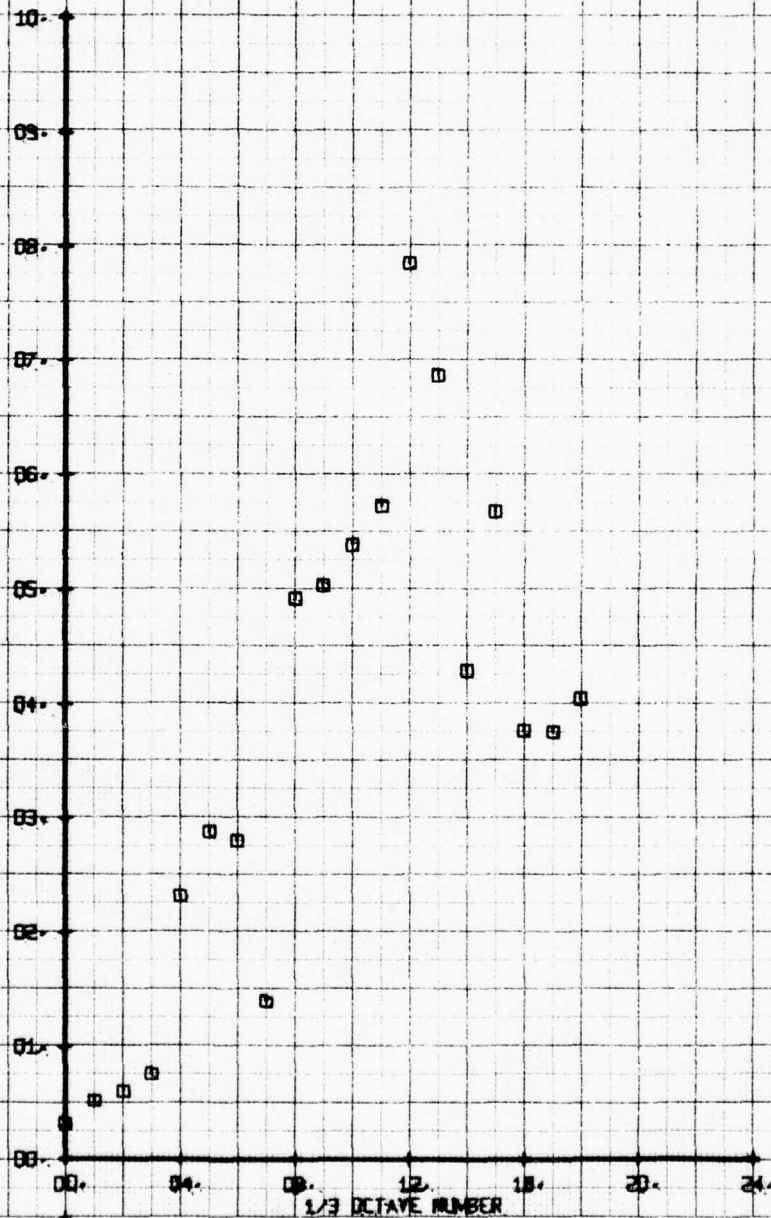
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS NO 810  
 RUN 172 TP 6

SYM  
 □

CN  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS

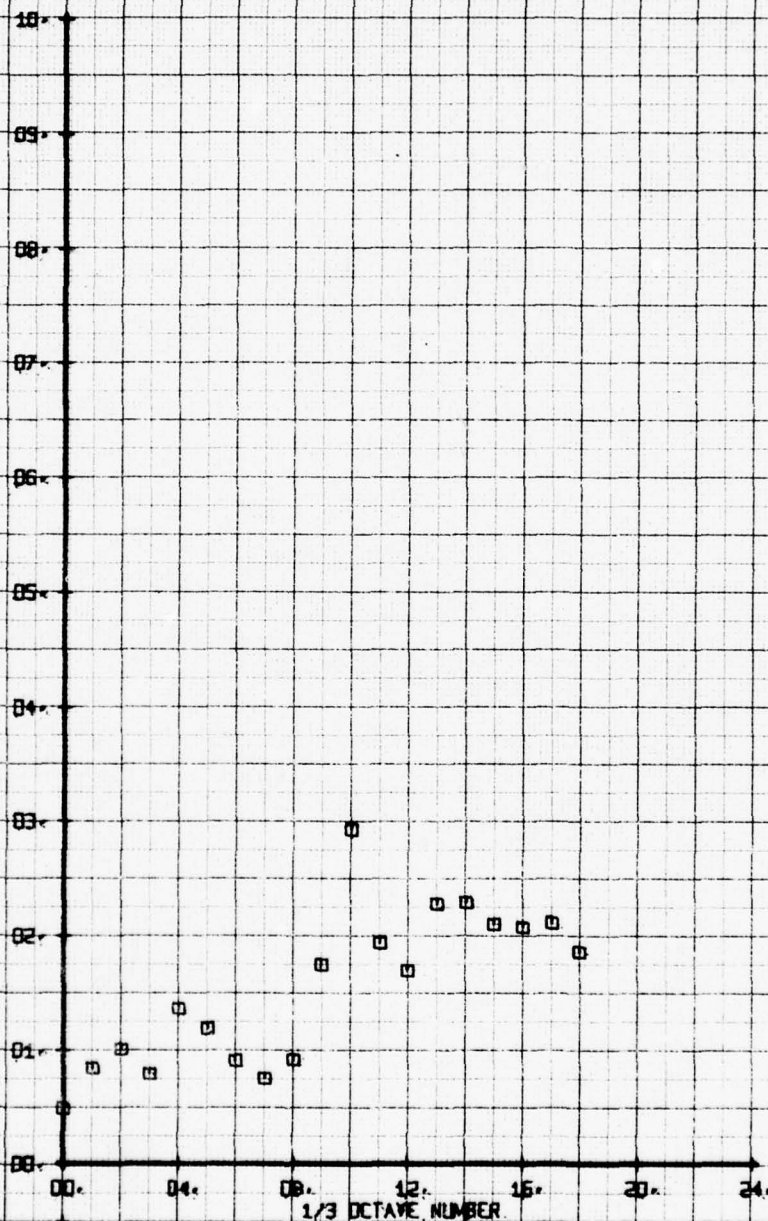




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF ATR EJECT BASIC SYS NO BLD  
RUN 172. TP 7

SYN CH  
01 66  
LEGEND  
PARAMETER  
V-ALPHA

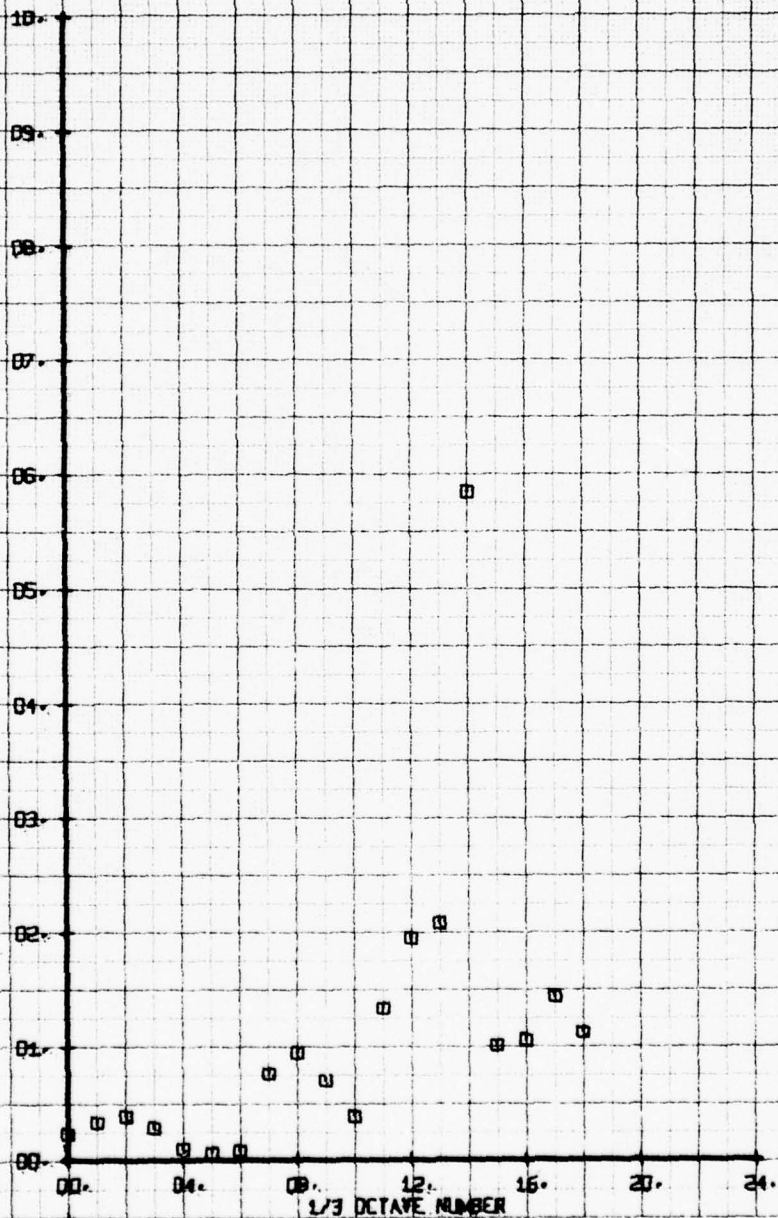
X-Y VELOCITY COMPONENT V-ALPHA FPS



NOI FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 810  
RUN 172 TP 8

SYN CH  
00 66  
PARAMETER  
V-ALPHA

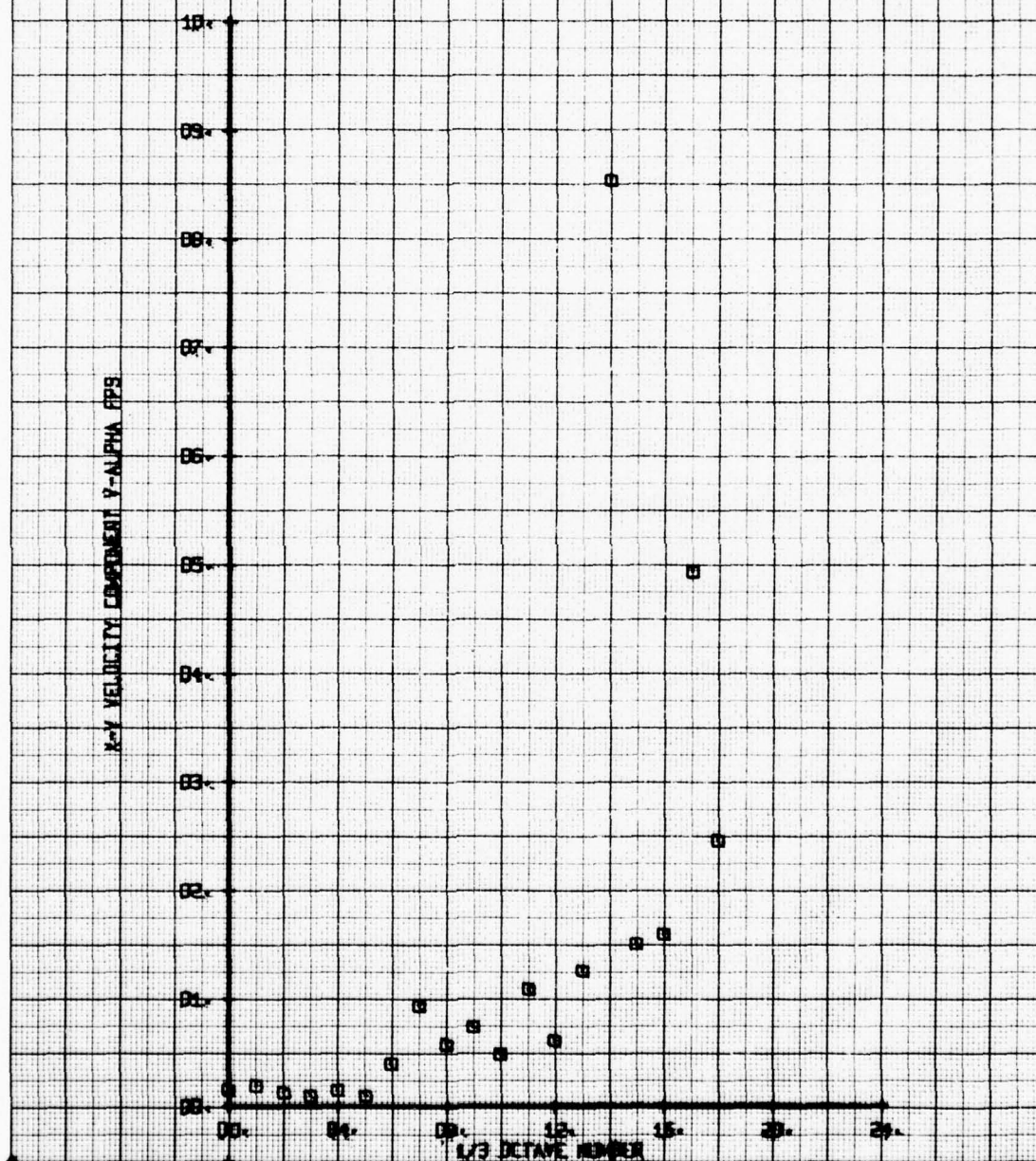
X-Y VELOCITY COMPONENT V-ALPHA FPS



HOF FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 810  
ROR 172 TP 9

LEGEND  
SYM CH PARAMETER  
01 06 V-ALPHA

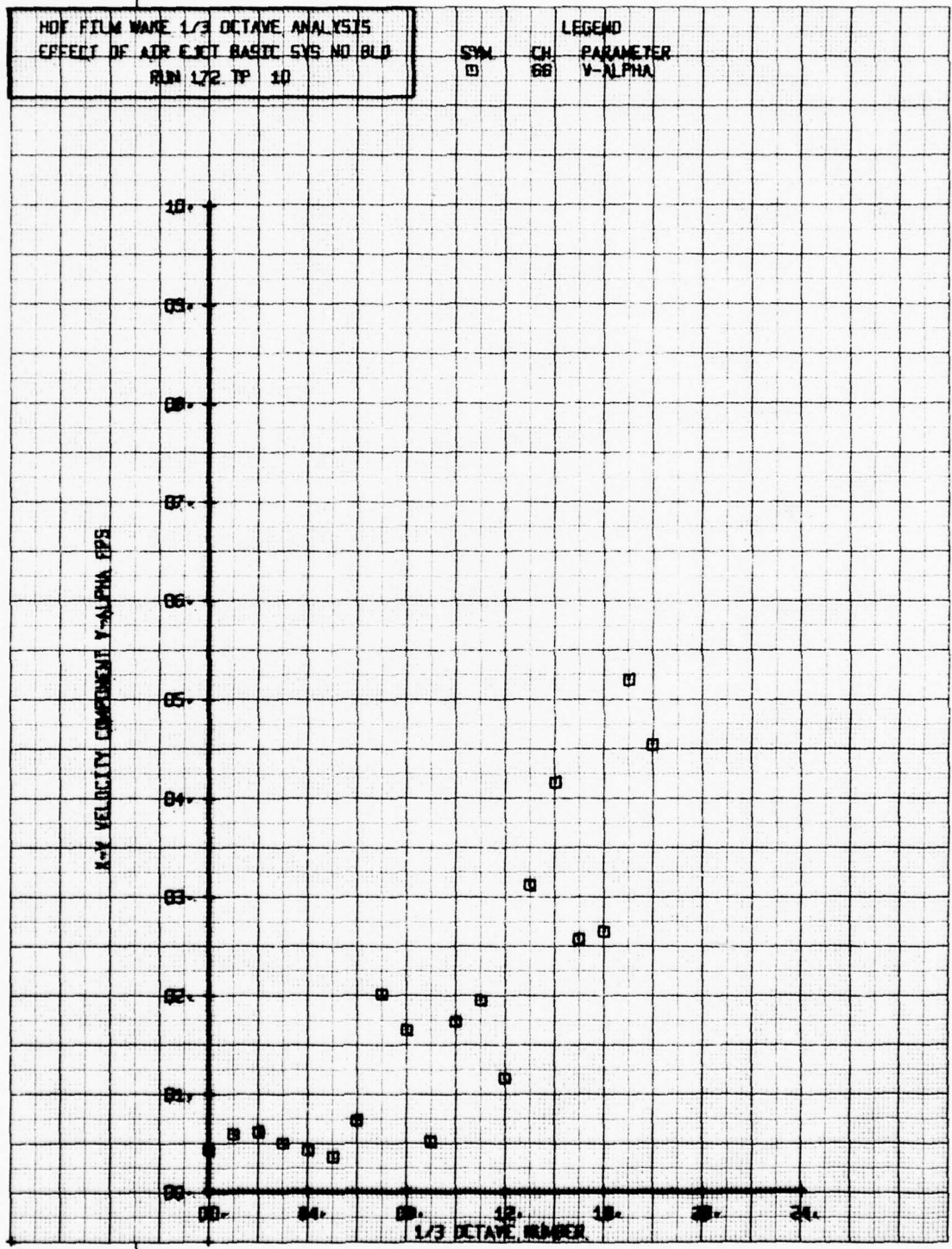
X-Y VELOCITY COMPONENT V-ALPHA FPS





NOF FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS NO BLD  
 RUN 172 TP 10

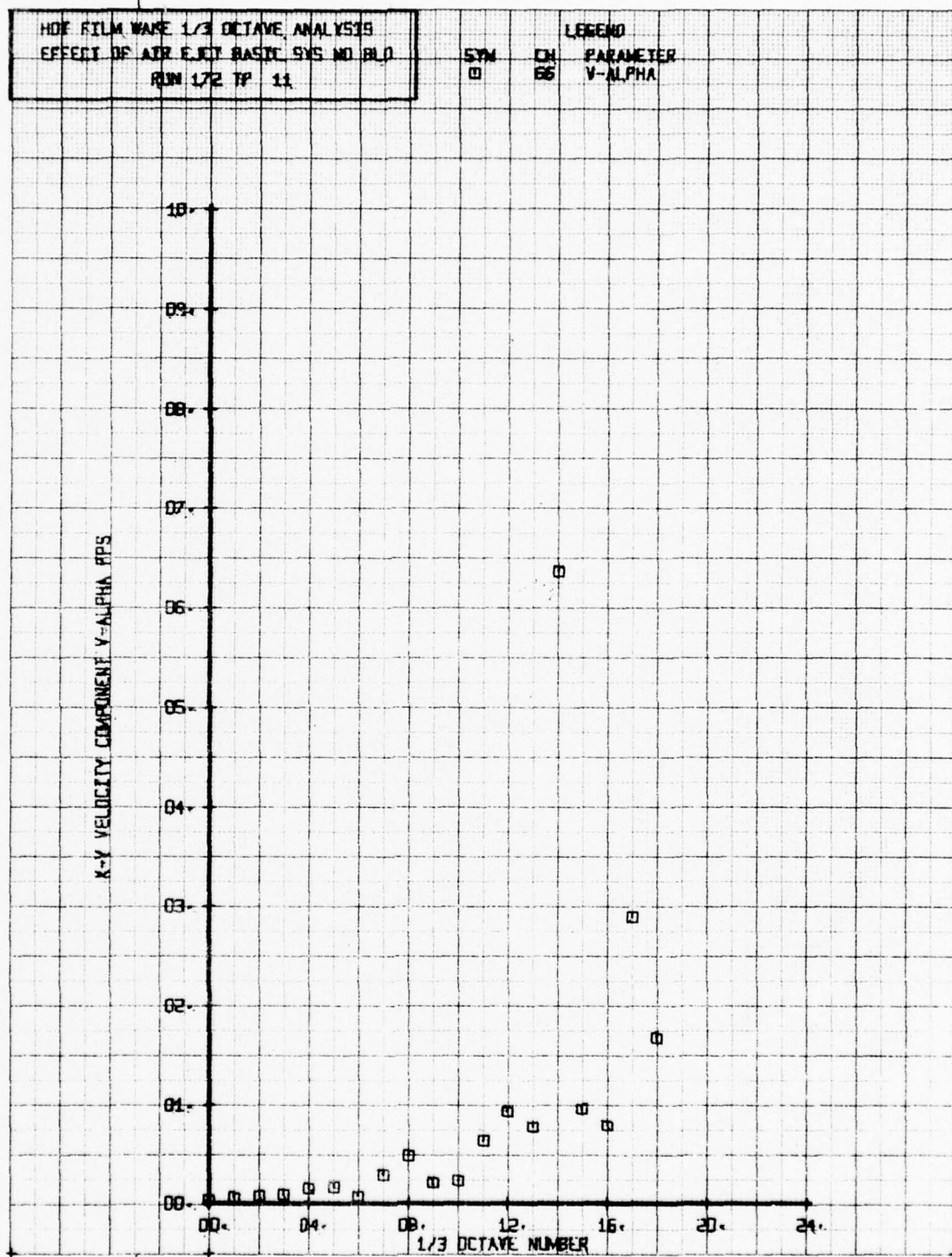
SYN CH  
 0 68  
 LEGEND  
 PARAMETER  
 V-ALPHA





HOF FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS NO BLD  
 RUN 172 TP 11

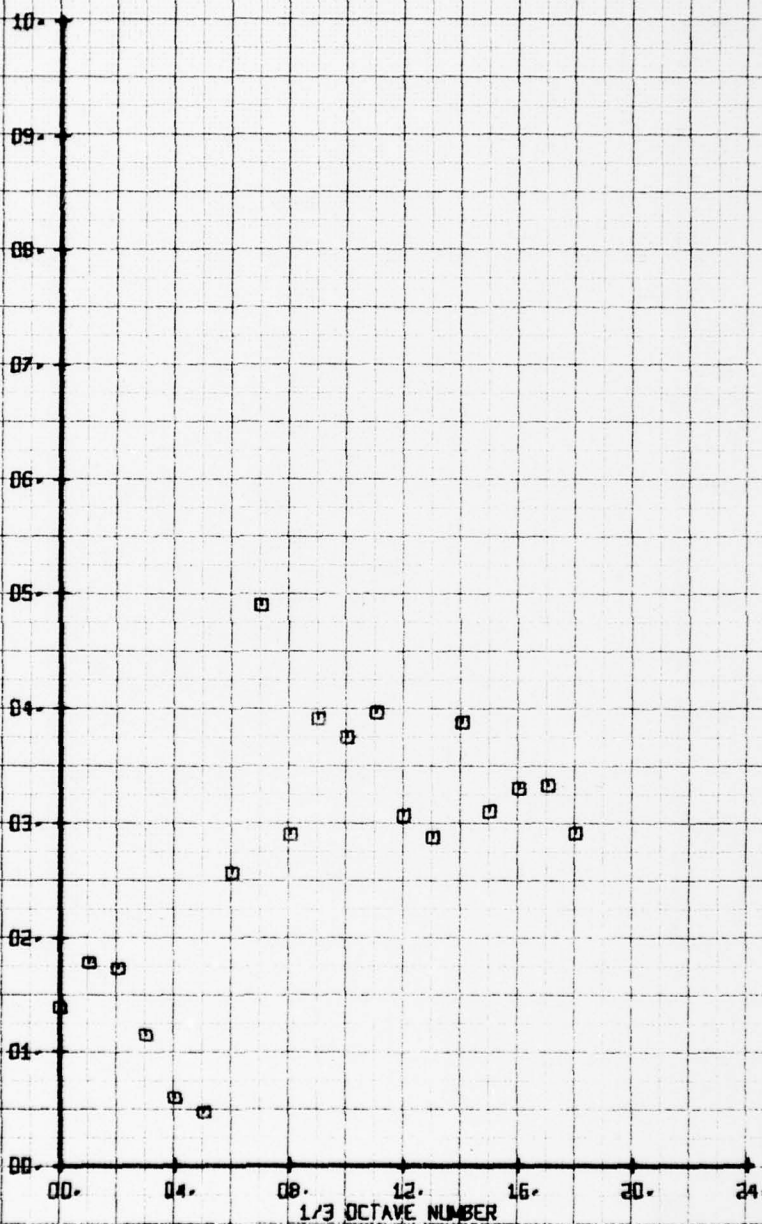
SYM CH PARAMETER  
 □ 66 V-ALPHA

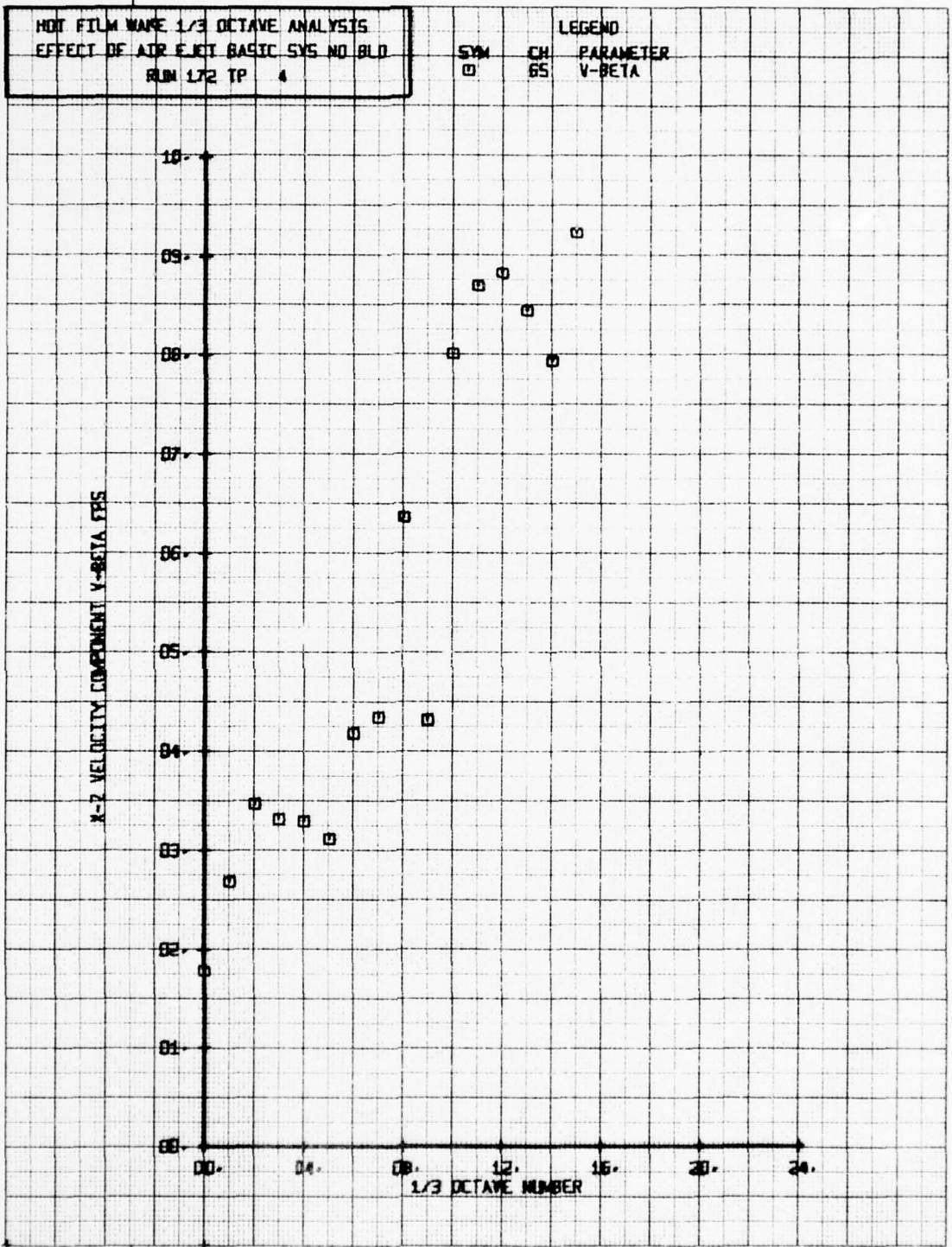


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EXIT BASIC SYS NO BLD  
RUN 172 TP 3

SYN CH PARAMETER  
0 65 V-BETA

X-2 VELOCITY COMPONENT Y-BETA FBS





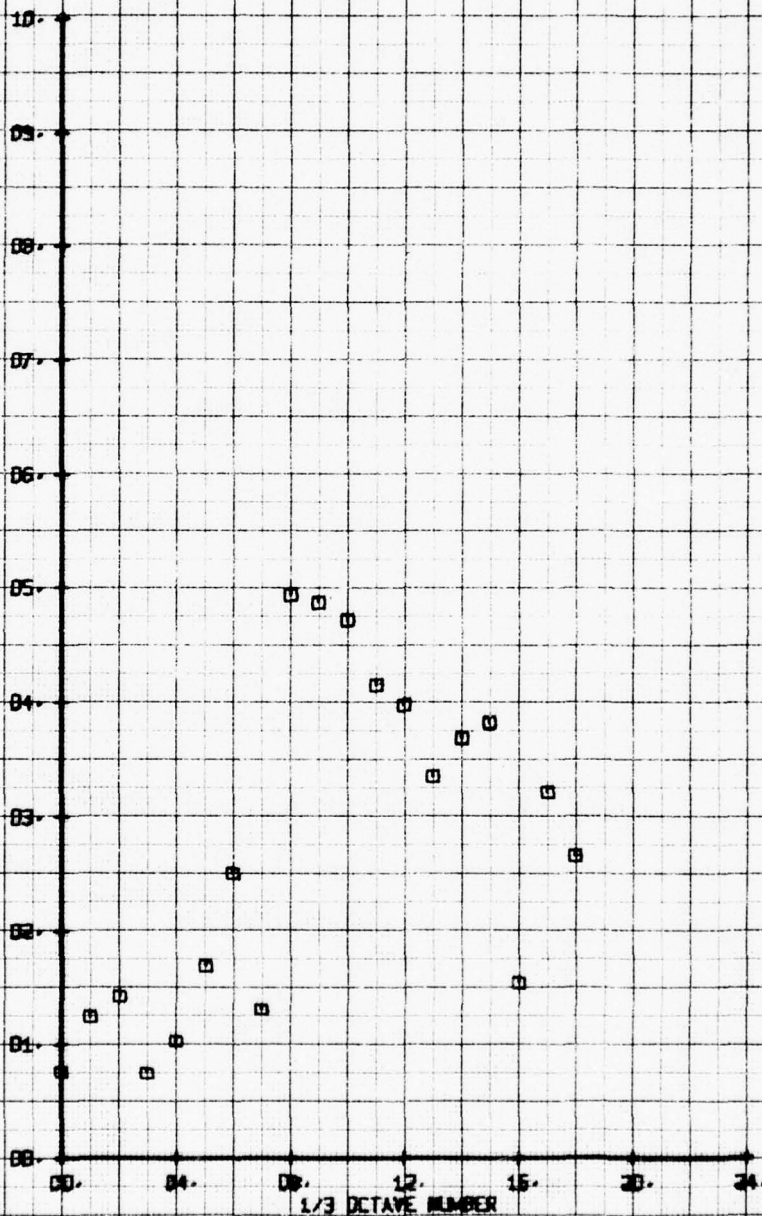
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS NO BLD  
 RUN 172 TP 6

SYM  
□

CH  
65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FTS

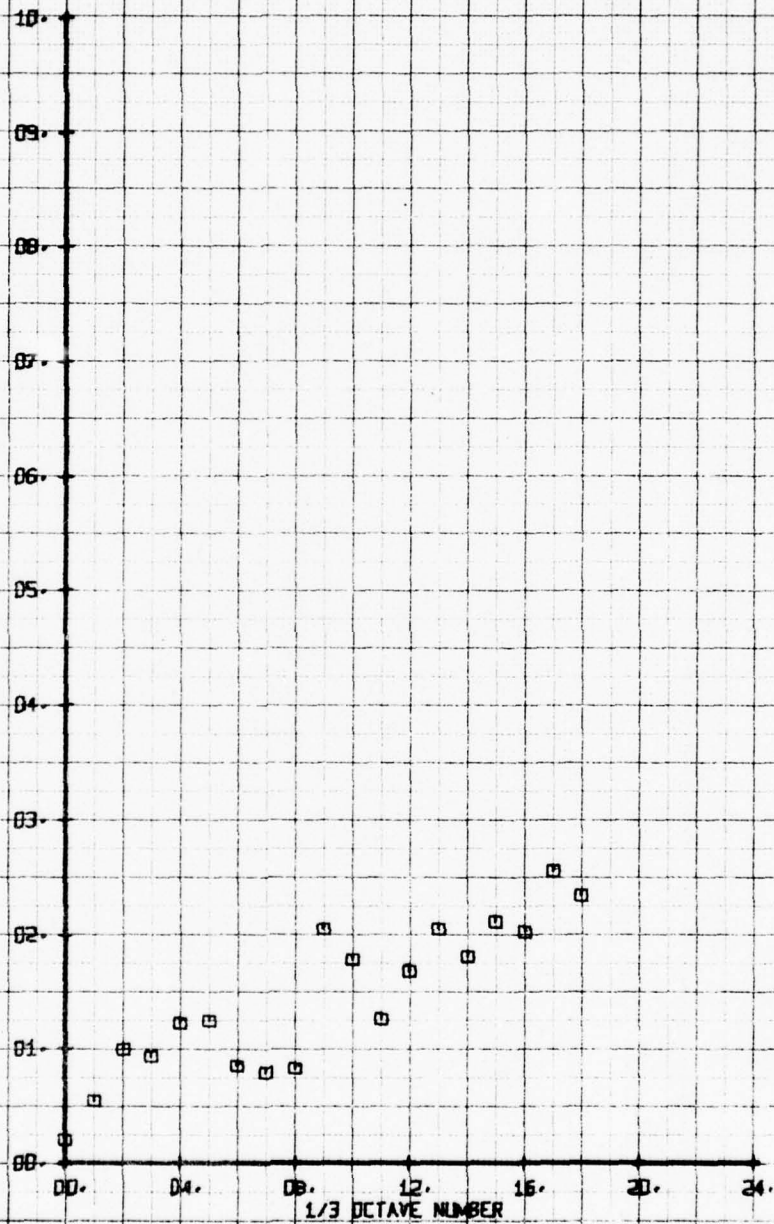




NOF FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS NO 8LD  
RUN 172 TP 7

SYN CH PARAMETER  
□ 65 V-BETA

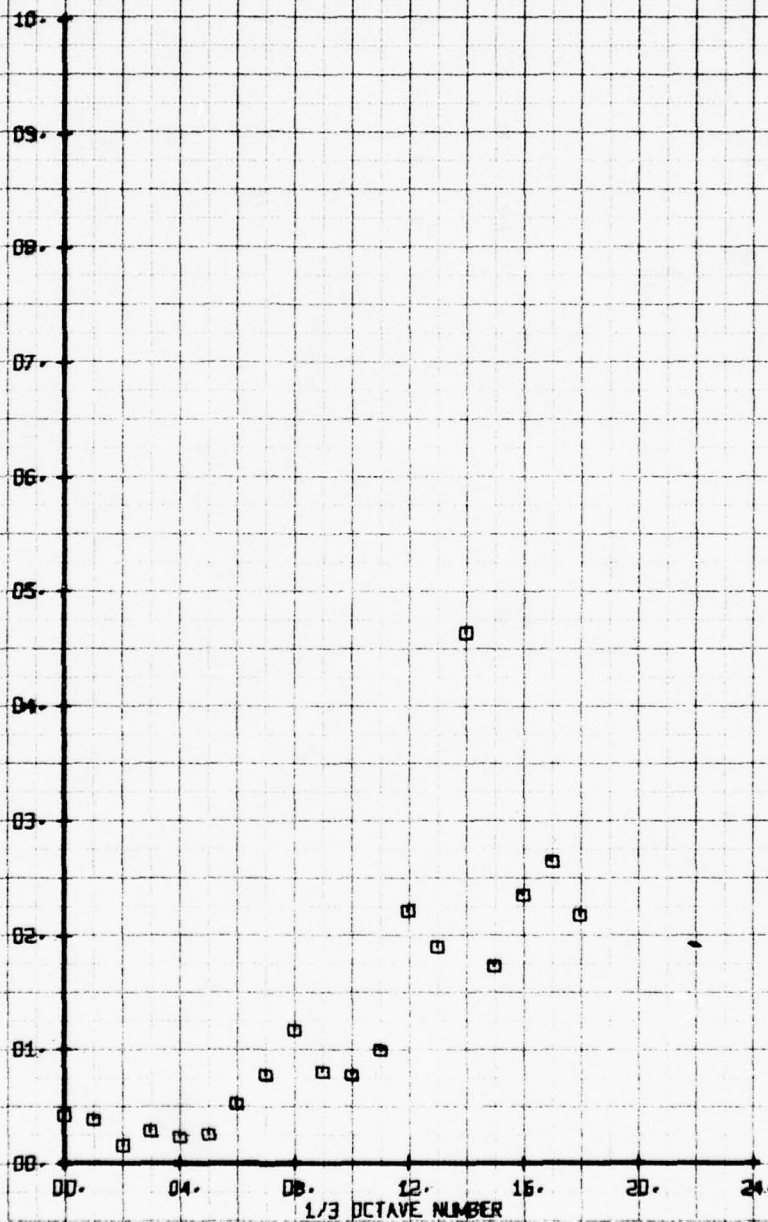
X-2 VELOCITY COMPONENT Y-BETA FBS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS NO 8LD  
 RUN 172 TP 8

SYM	CH	PARAMETER
□	65	V-BETA

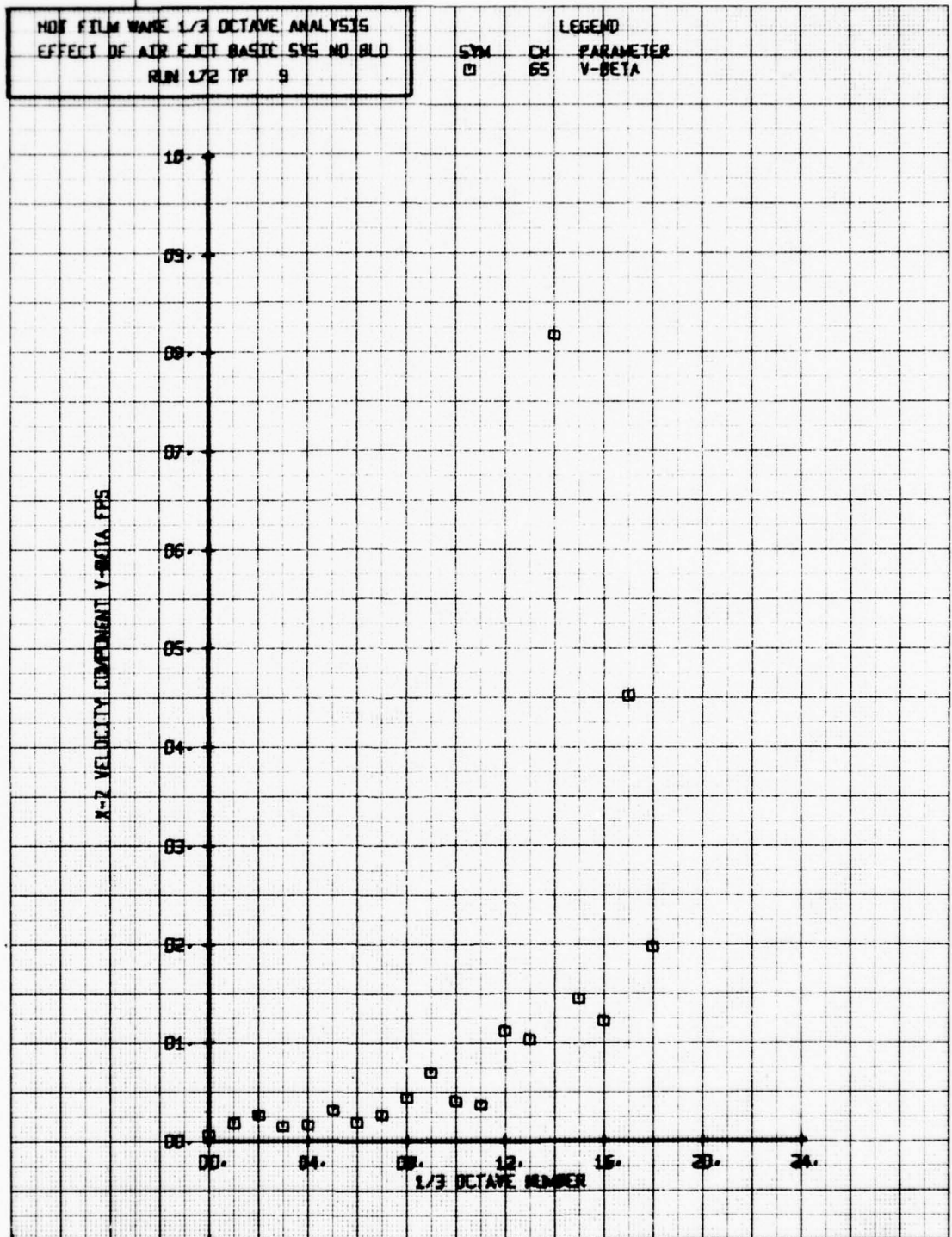
X-2 VELOCITY COMPONENT V-BETA FFS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS NO. 810  
 RUN 172 TP 9

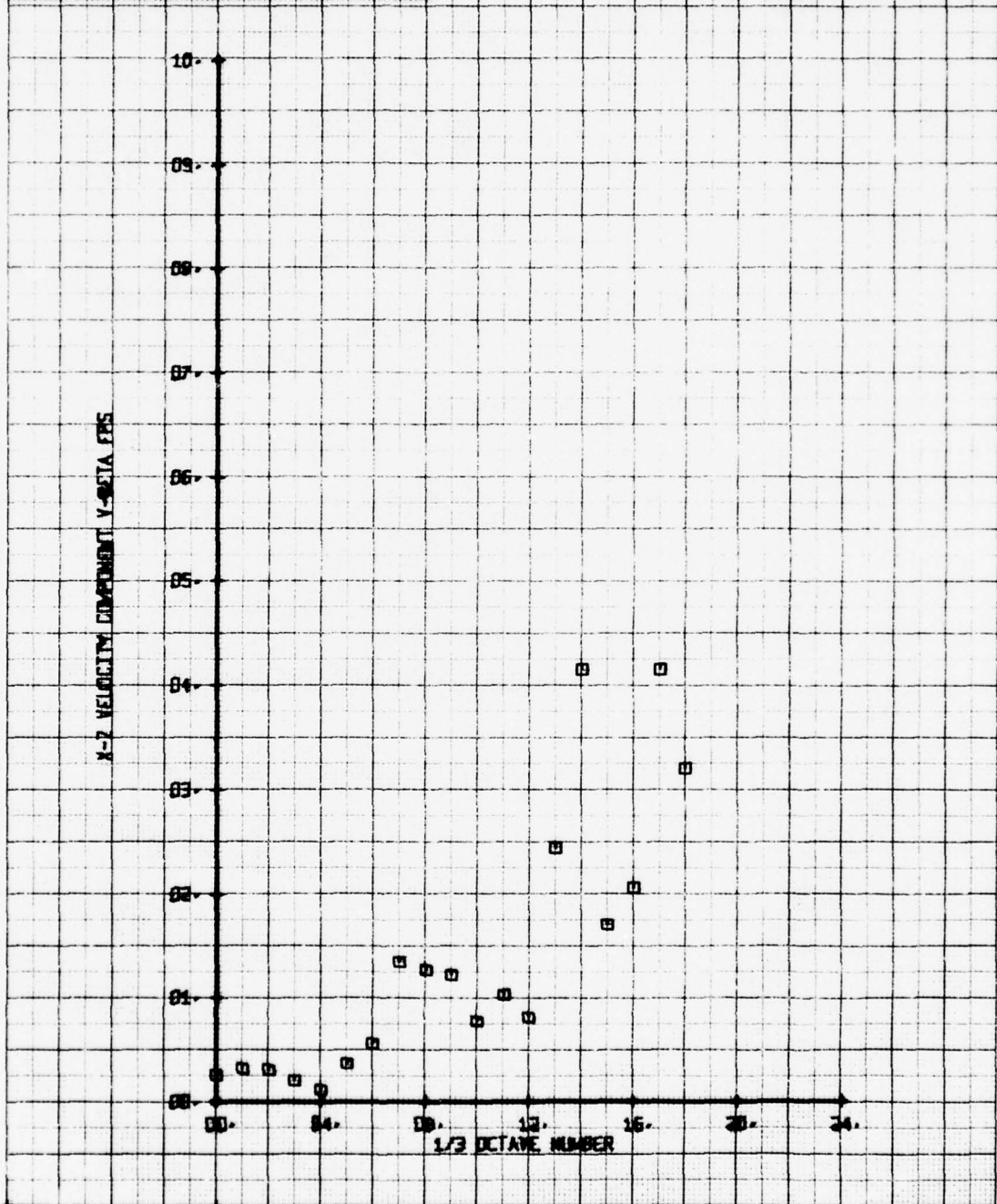
SYM CH PARAMETER  
 □ 65 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS NO 8LD  
 RUN 172 TP 10

LEGEND  
 CH 65  
 PARAMETER  
 V-BETA

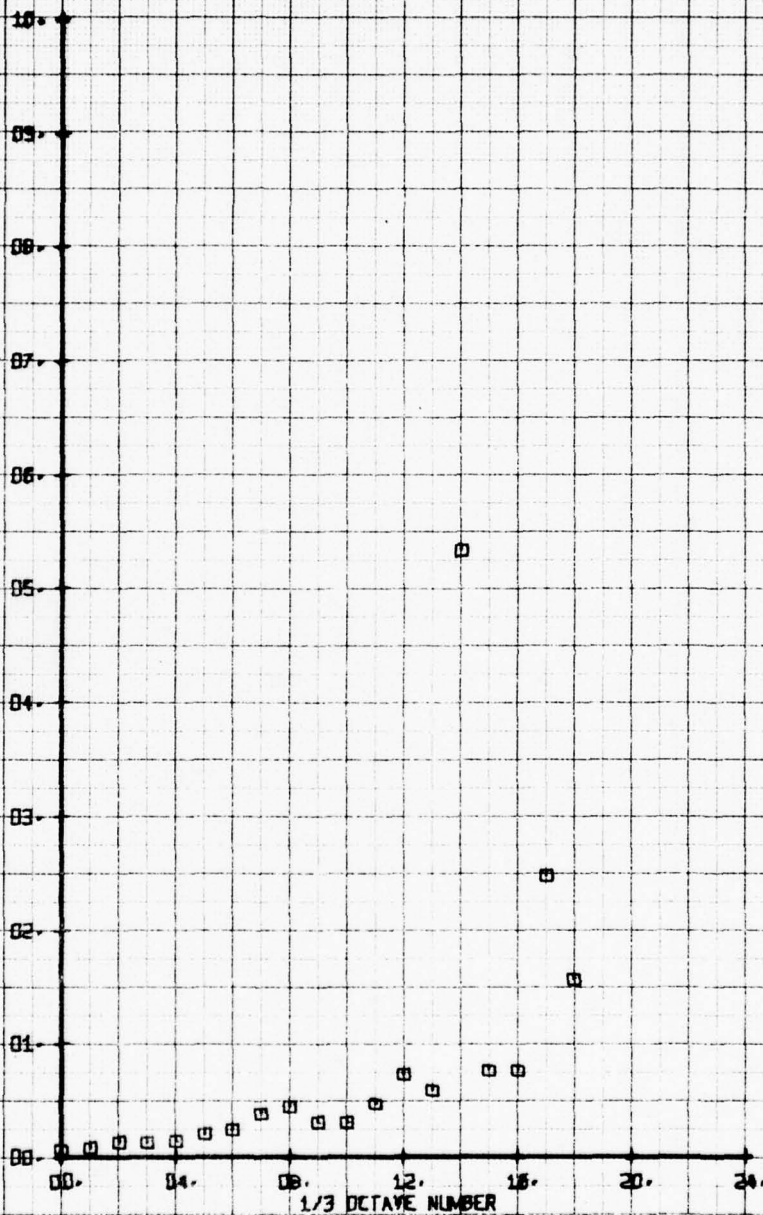




NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS NO BLD  
 RUN 172 TP 11

LEGEND  
 CH 65  
 PARAMETER  
 V-BETA

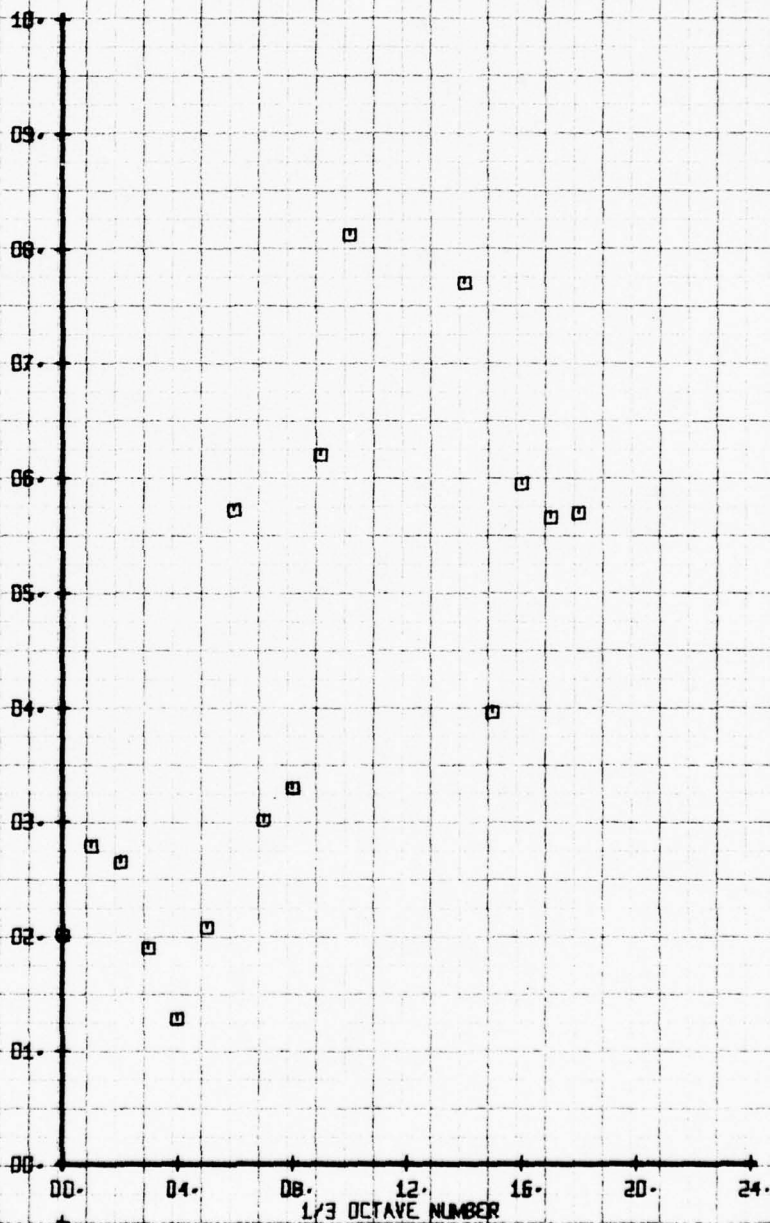
X-2 VELOCITY COMPONENT V-BETA FTS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 1

SYM CH PARAMETER  
□ 66 ALPHA

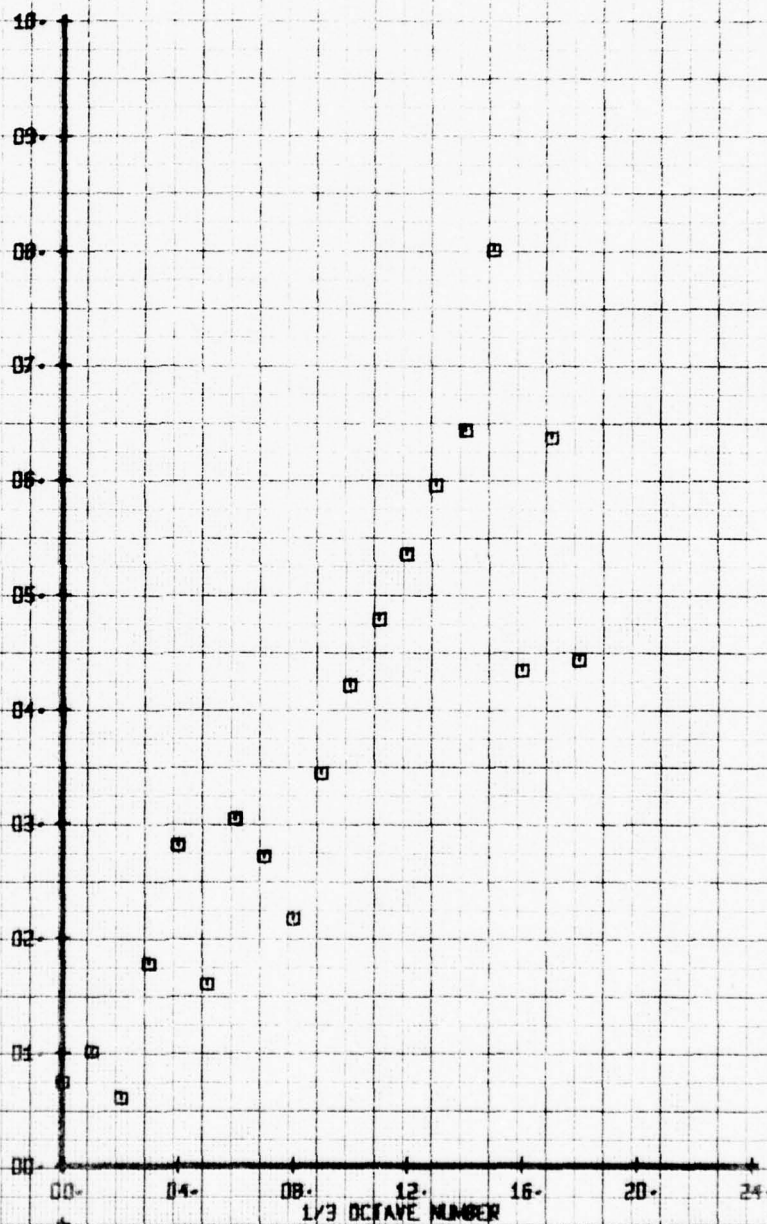
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 2

LEGEND  
SYM CH PARAMETER  
□ 66 ALPHA

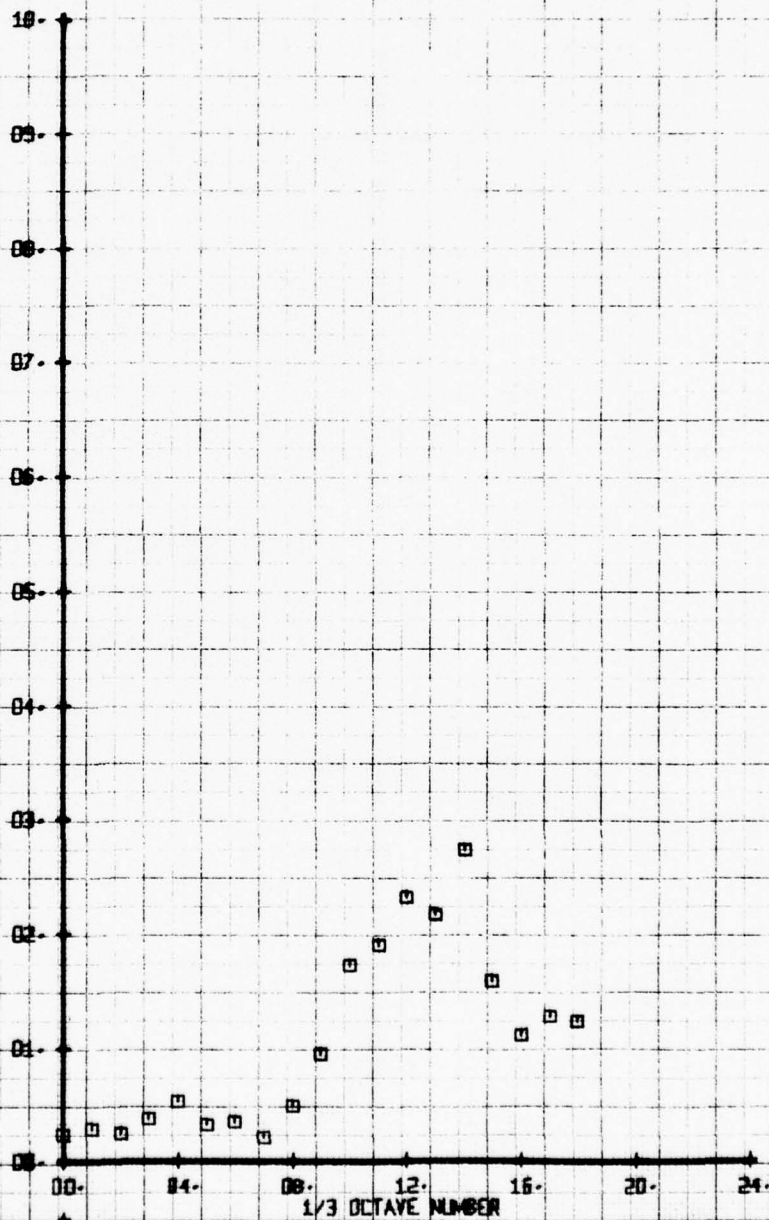
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 3

LEGEND  
SYM CH PARAMETER  
□ 66 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES

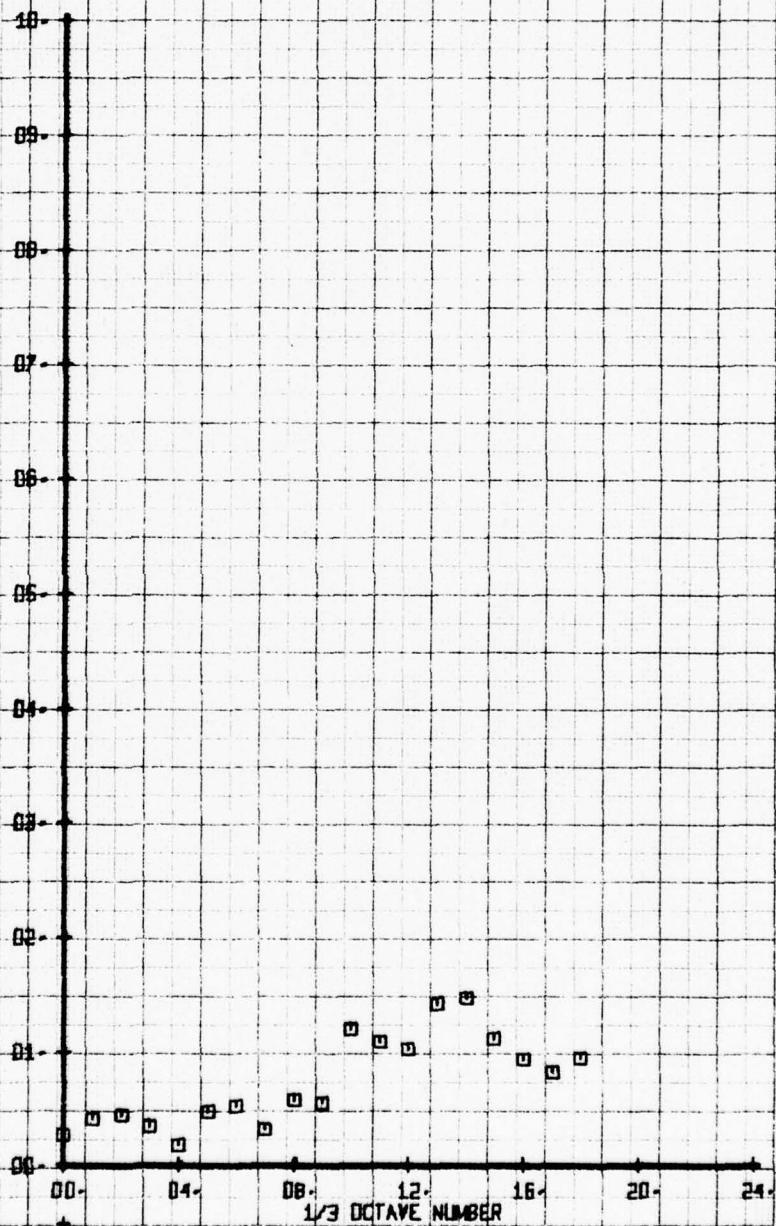




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS 40PST  
 RUN 173 TP 4

LEGEND  
 CH 66  
 PARAMETER ALPHA

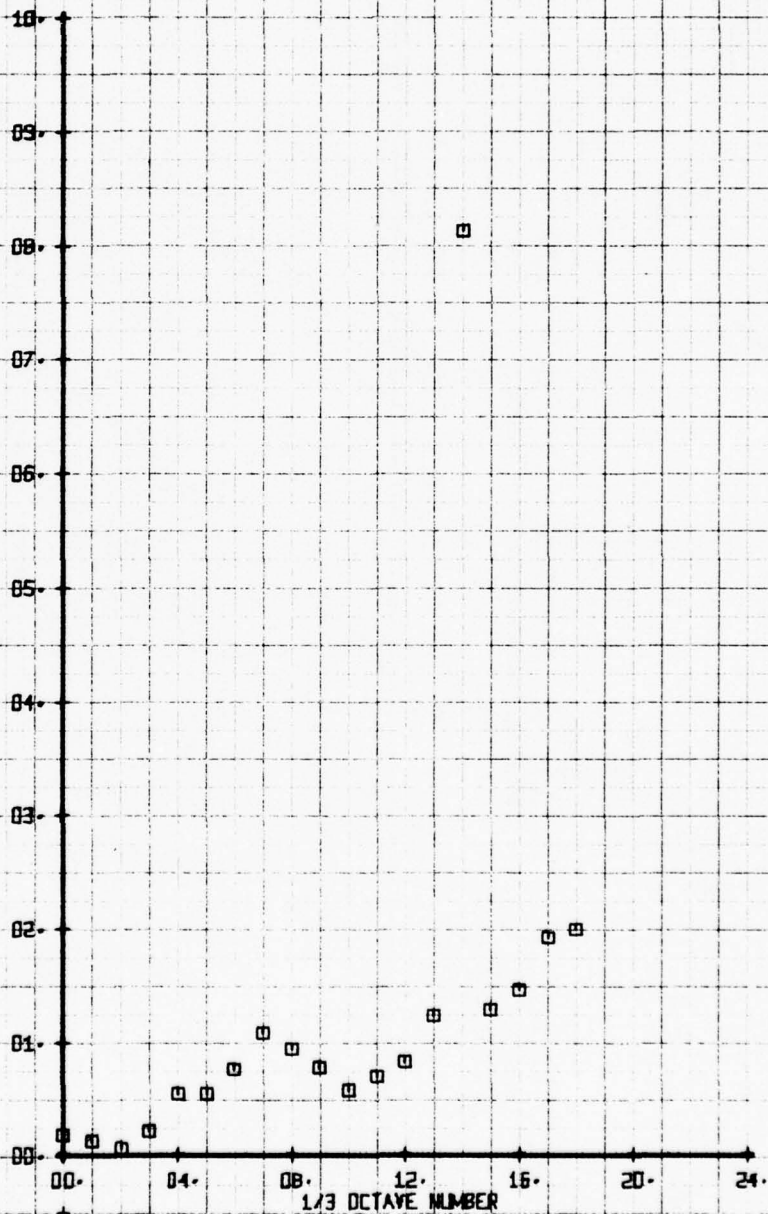
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS ADPST  
RUN 173 TP 5

LEGEND  
SYM CH PARAMETER  
□ 66 ALPHA

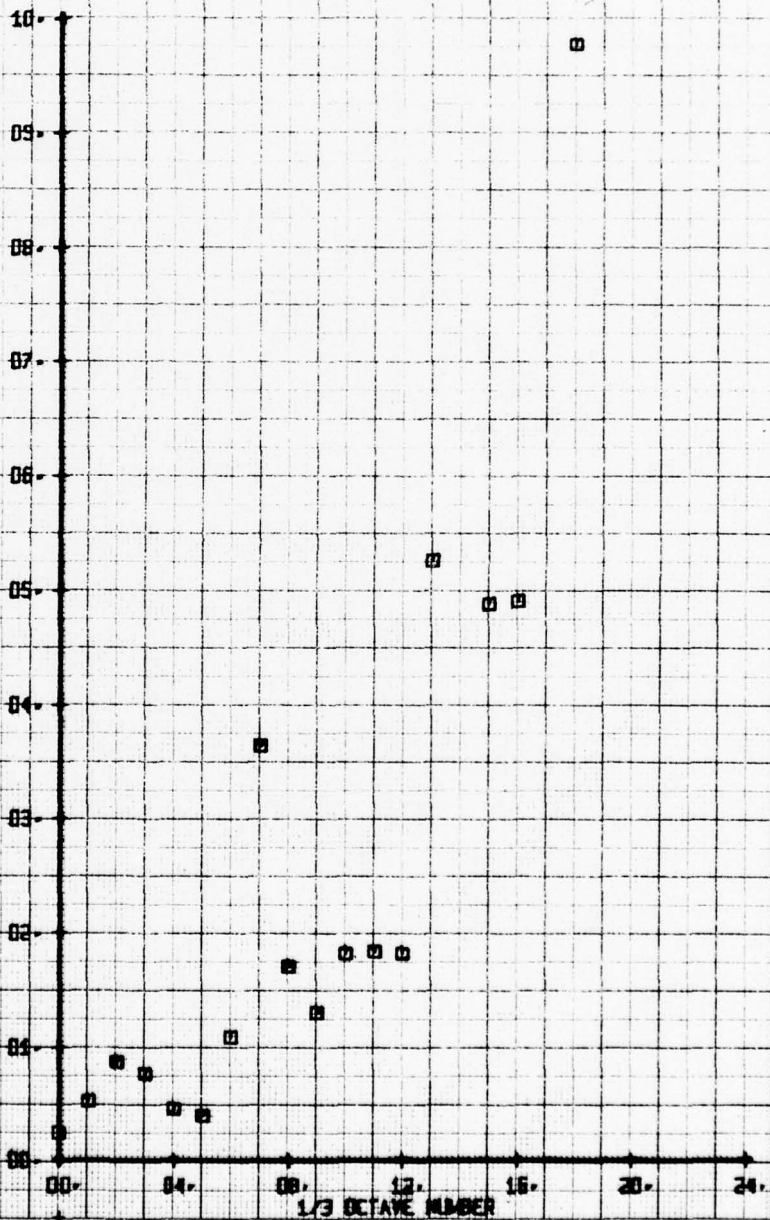
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 6

LEGEND  
SYM CH PARAMETER  
□ 66 ALPHA

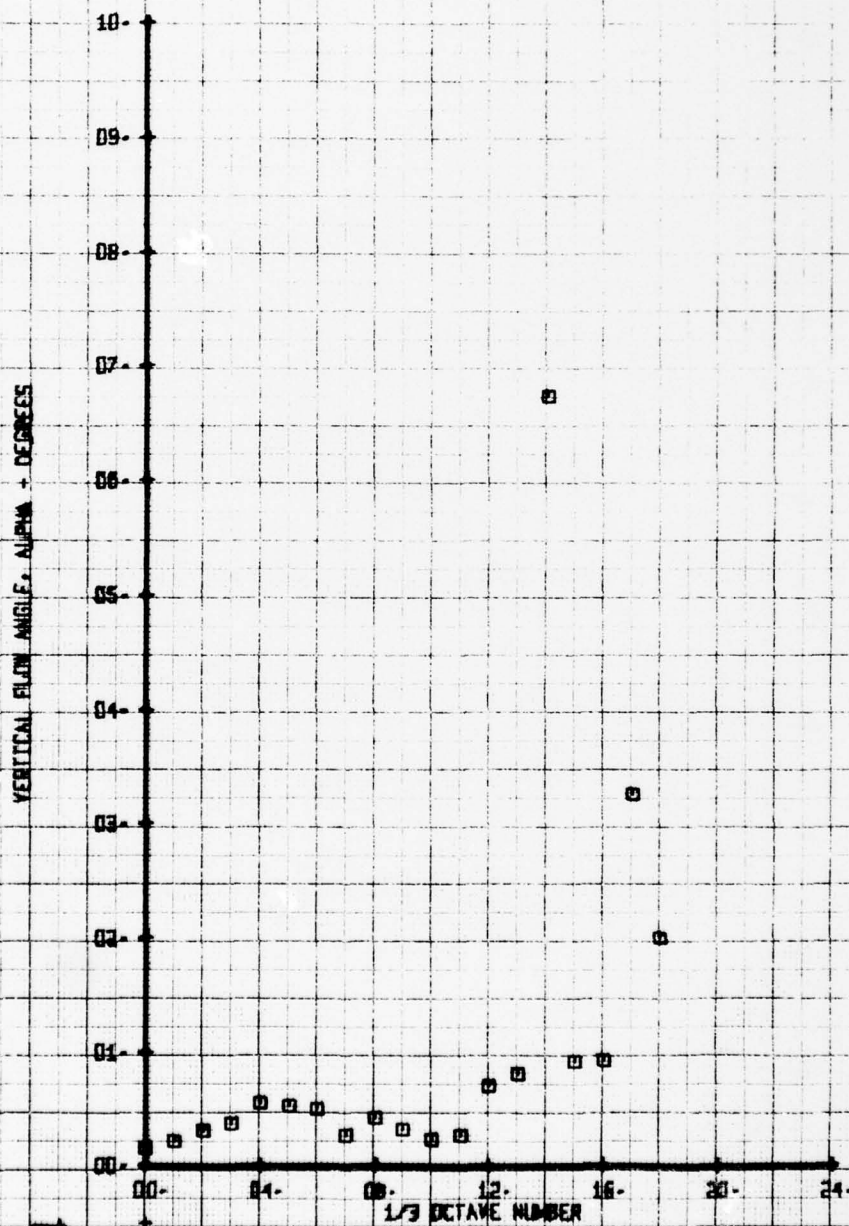
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 40PSI  
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SYM  
 □

LEGEND  
 CH: 66  
 PARAMETER  
 ALPHA





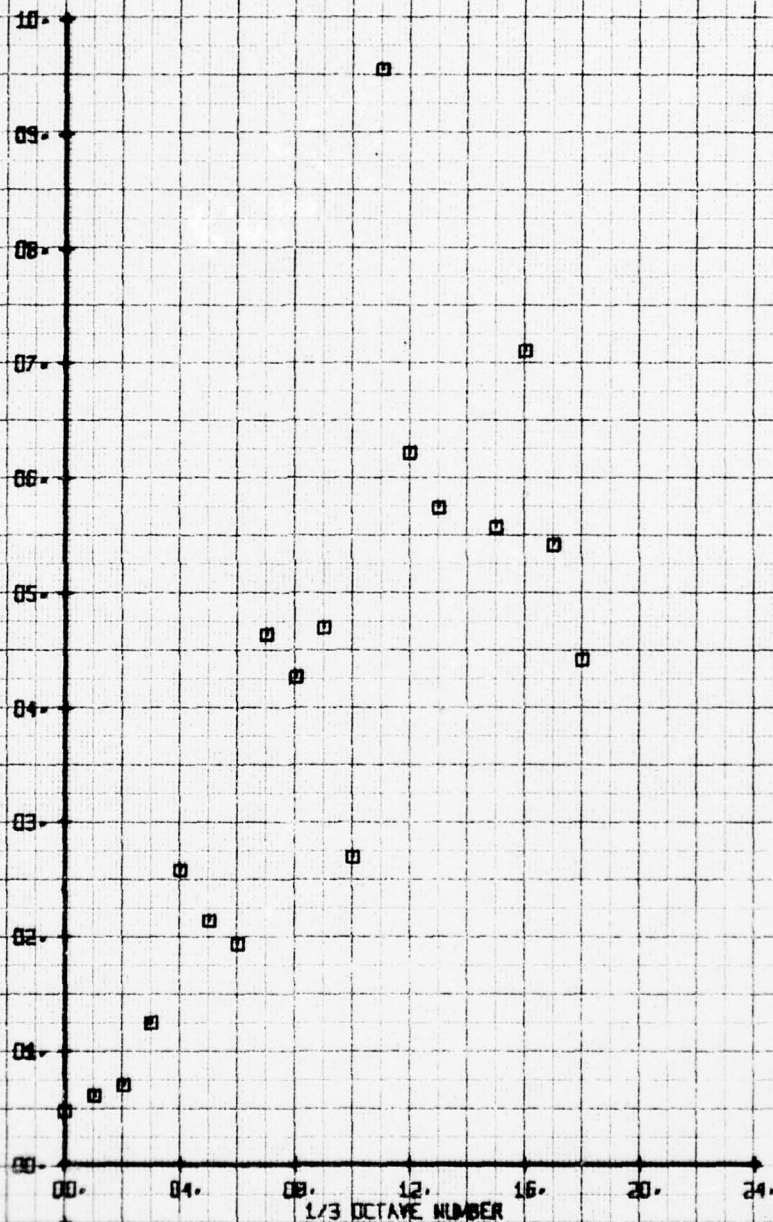
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF ADR EJECT BASIC SYS ADP51  
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SYM  
□

CN  
65

LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



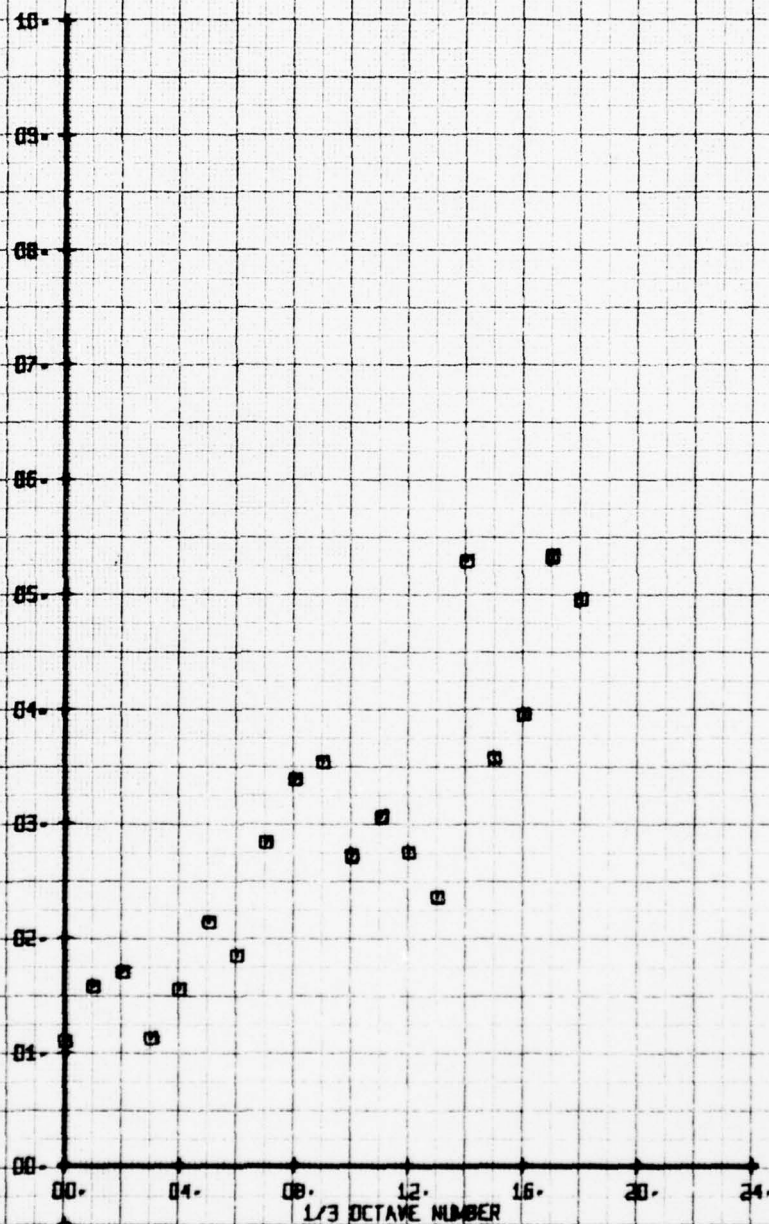
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR FLOW BASIC SYS 40851  
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SYM  
01

CH  
65

LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



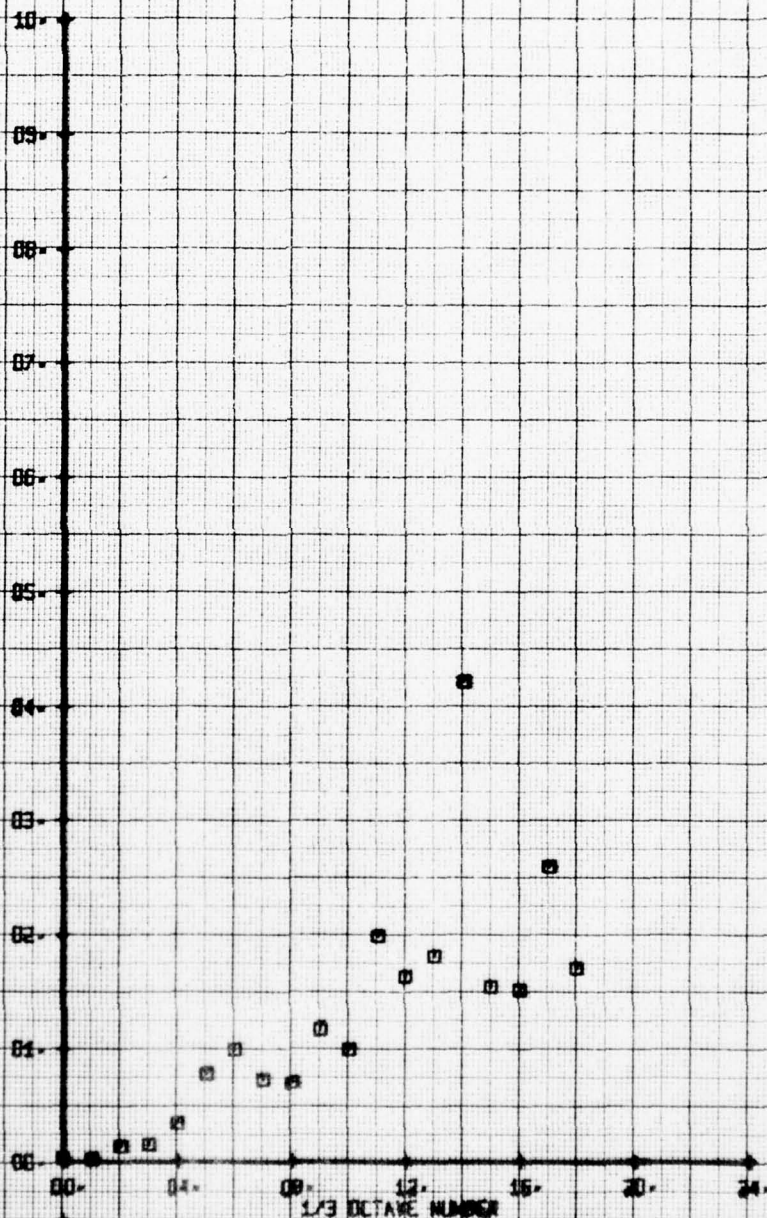
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 3

SYM  
CH

CH  
65

LEGEND  
PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES





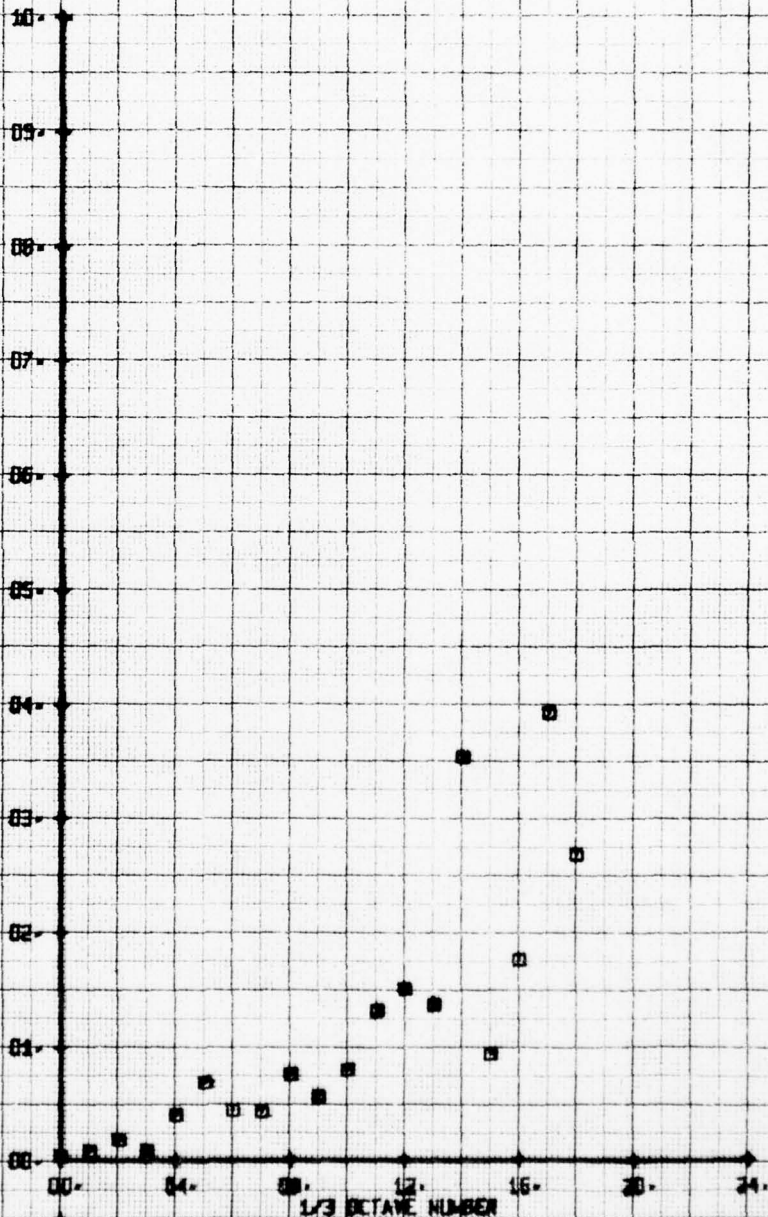
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40P51  
RUN 173 TP 4

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA

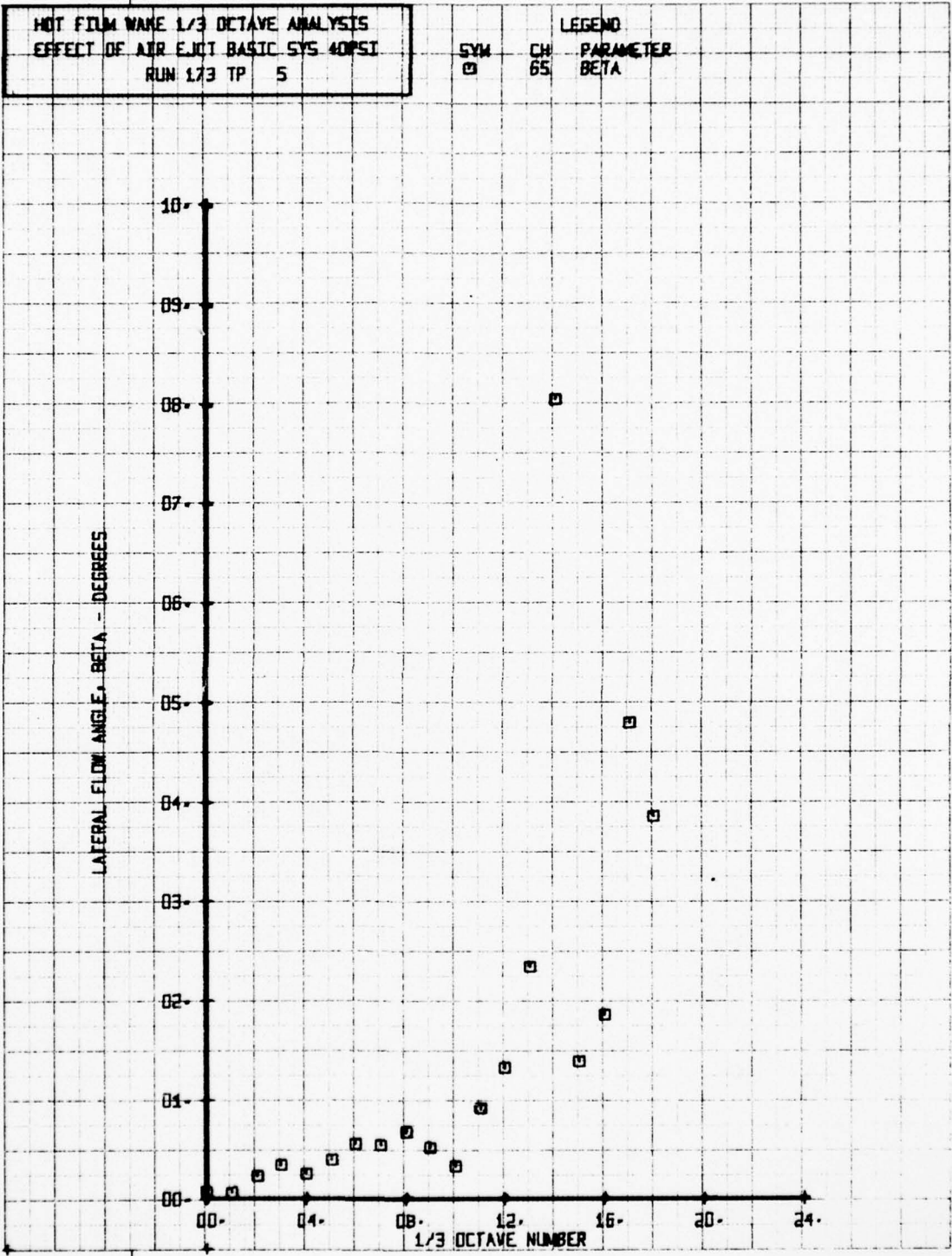
LATERAL FLOW ANGLE, BETA - DEGREES





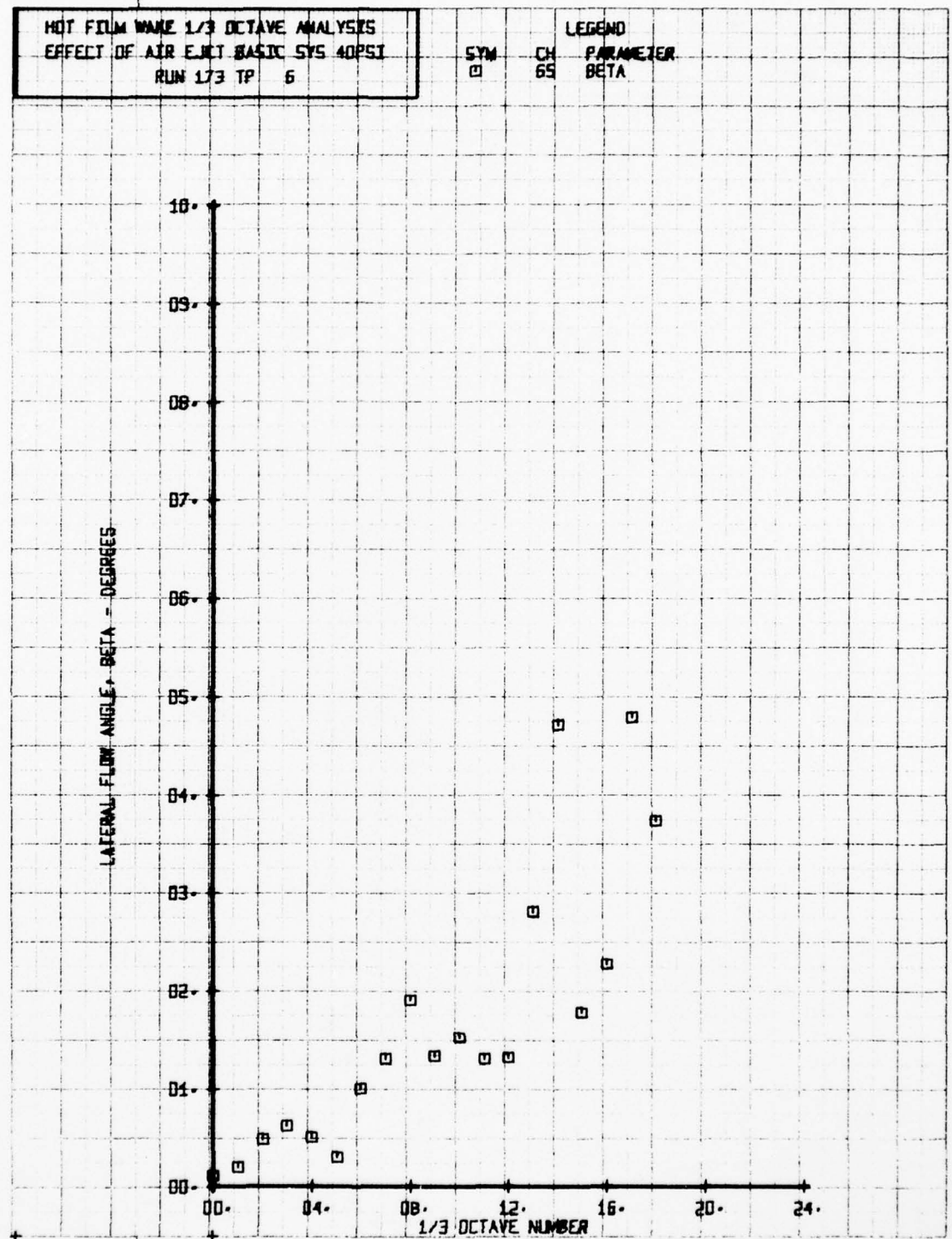
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 5

LEGEND  
SYM CH PARAMETER  
□ 65 BETA



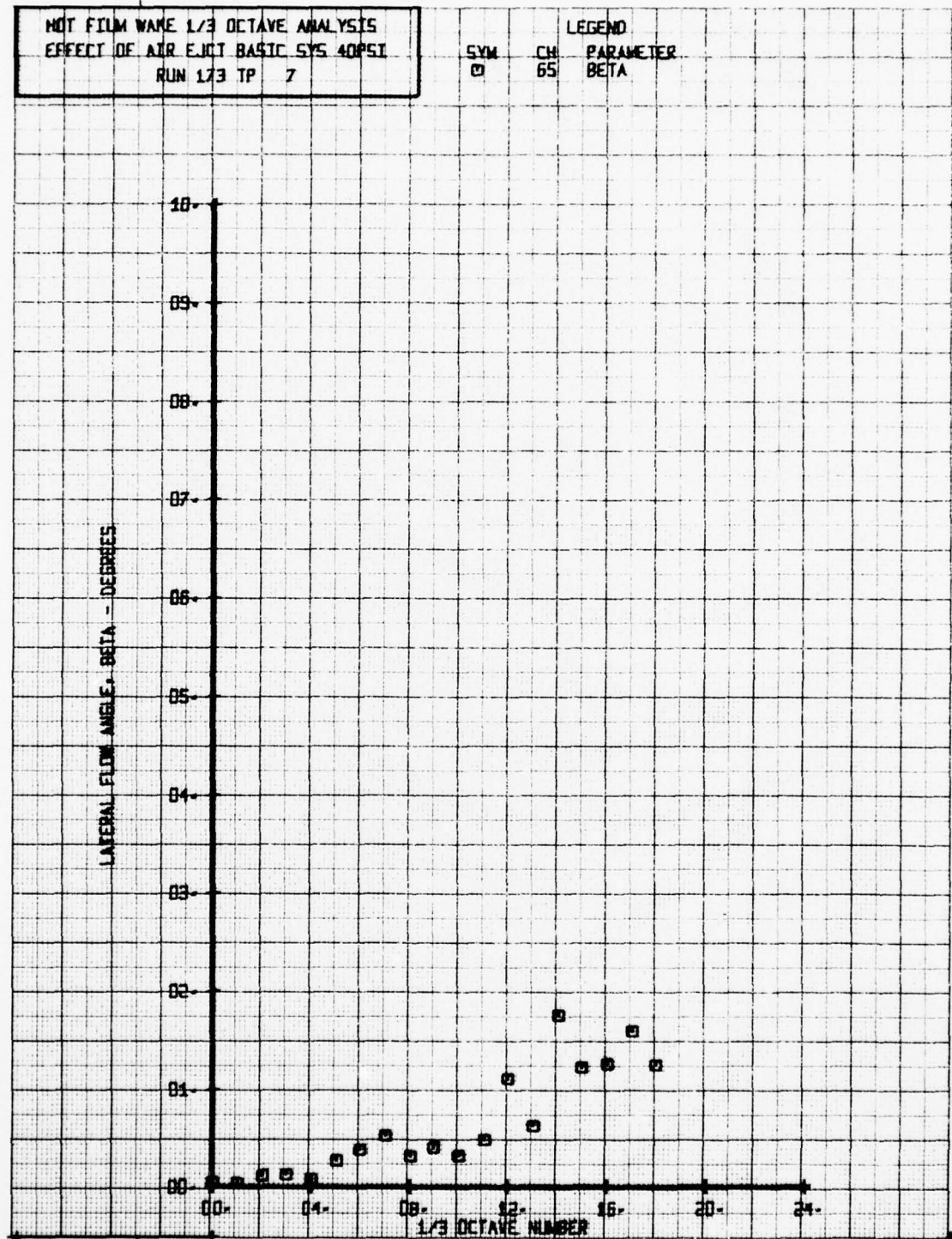
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 6

SYM CH PARAMETER  
□ 65 BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PSI  
RUN 173 TP 7

LEGEND  
SYM CH PARAMETER  
□ 65 BETA



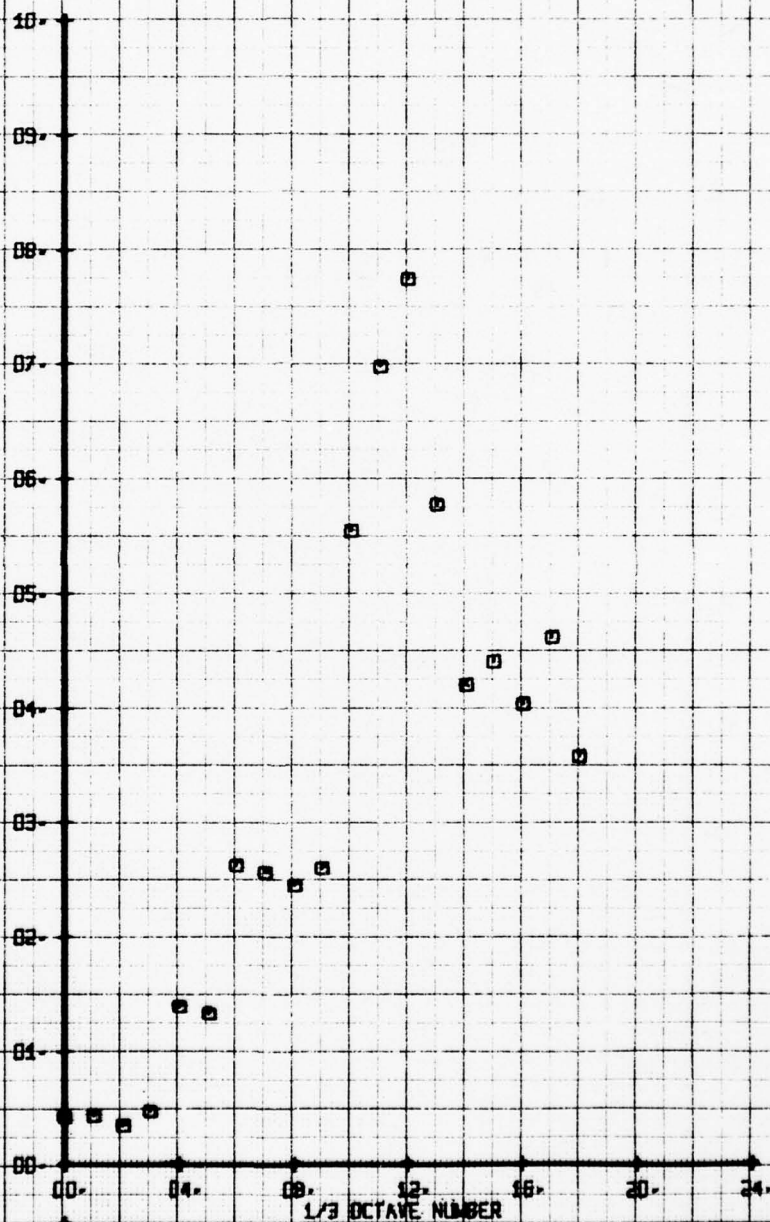
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40PST  
RUN 173 TP 1

SYM  
□

CH  
66

LEGEND  
PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA EPS





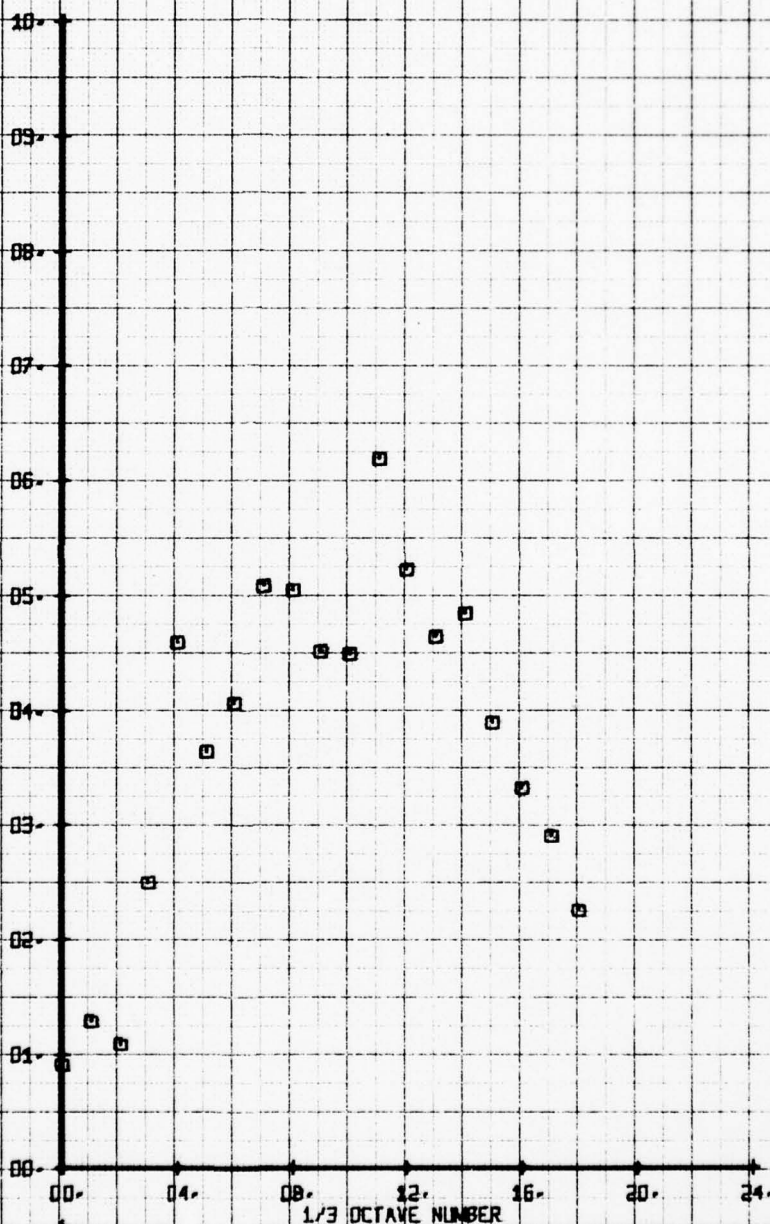
HOT FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS ADJUST  
RUN 173 TP 2

SYM  
□

CH  
66

LEGEND  
PARAMETER  
V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS ADJUST  
RUN 173 TP 3

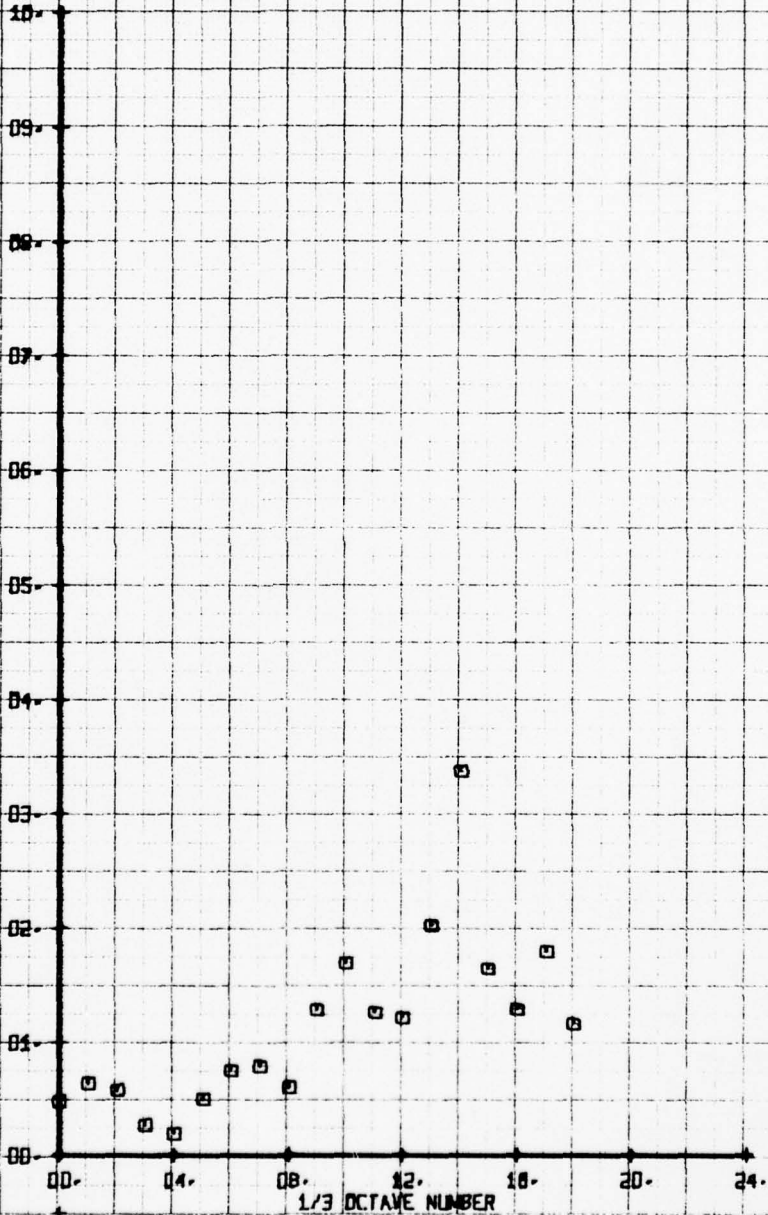
SYM  
□

CH  
66

LEGEND

PARAMETER  
V-ALPHA

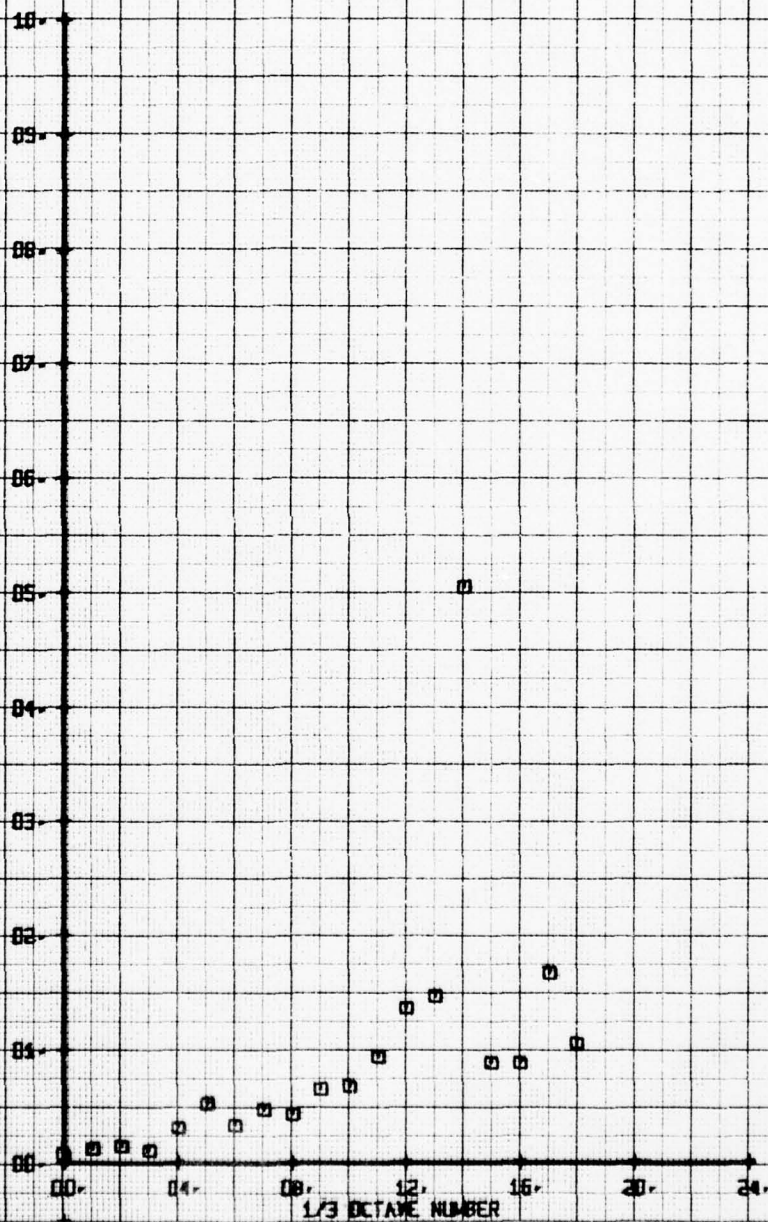
X-Y VELOCITY COMPONENT V-ALPHA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR JET BASIC SYS ADPST  
 RUN 173 TP 1

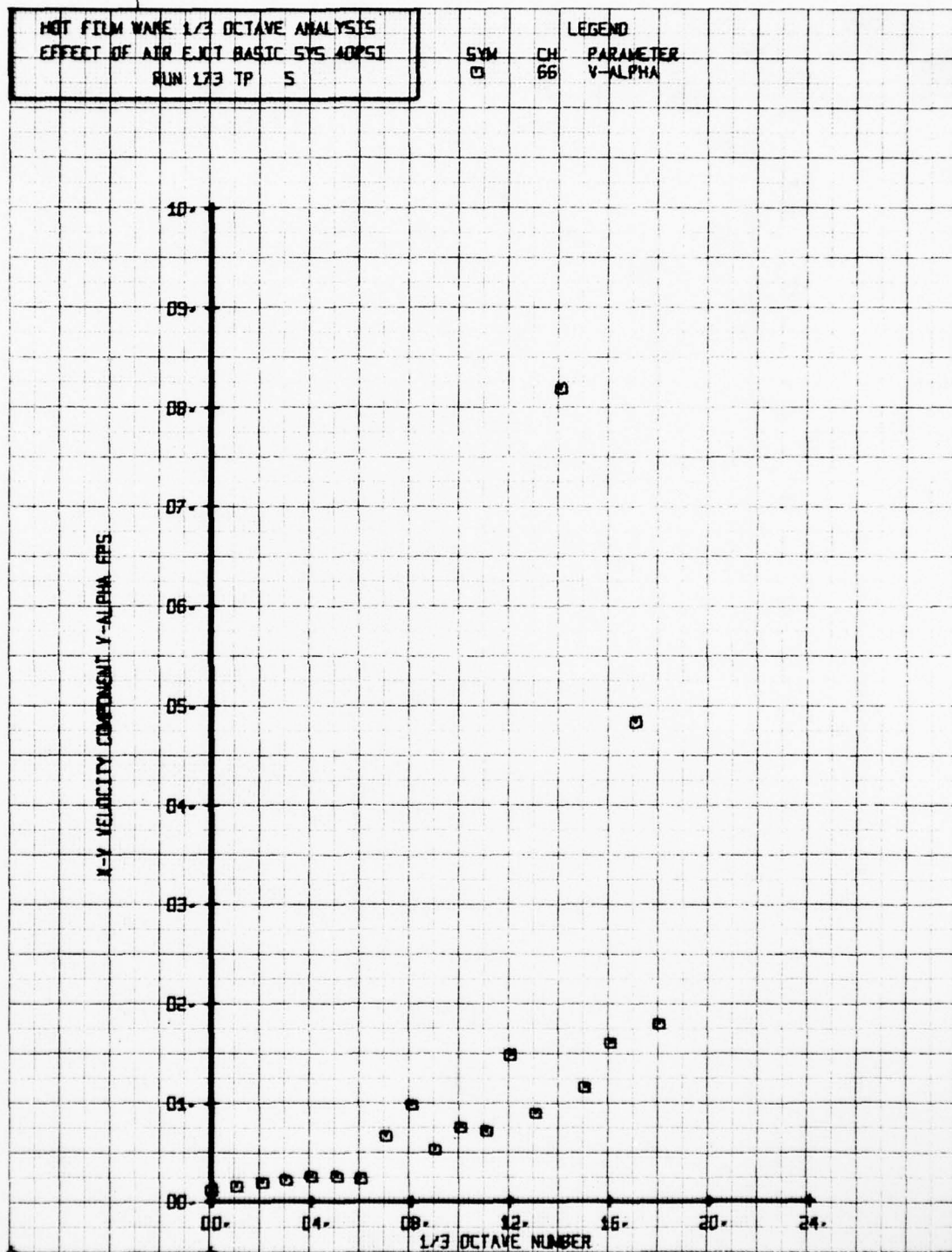
LEGEND  
 CH 66  
 PARAMETER  
 V-ALPHA

1/2 VELOCITY COMPONENT V-ALPHA FPS

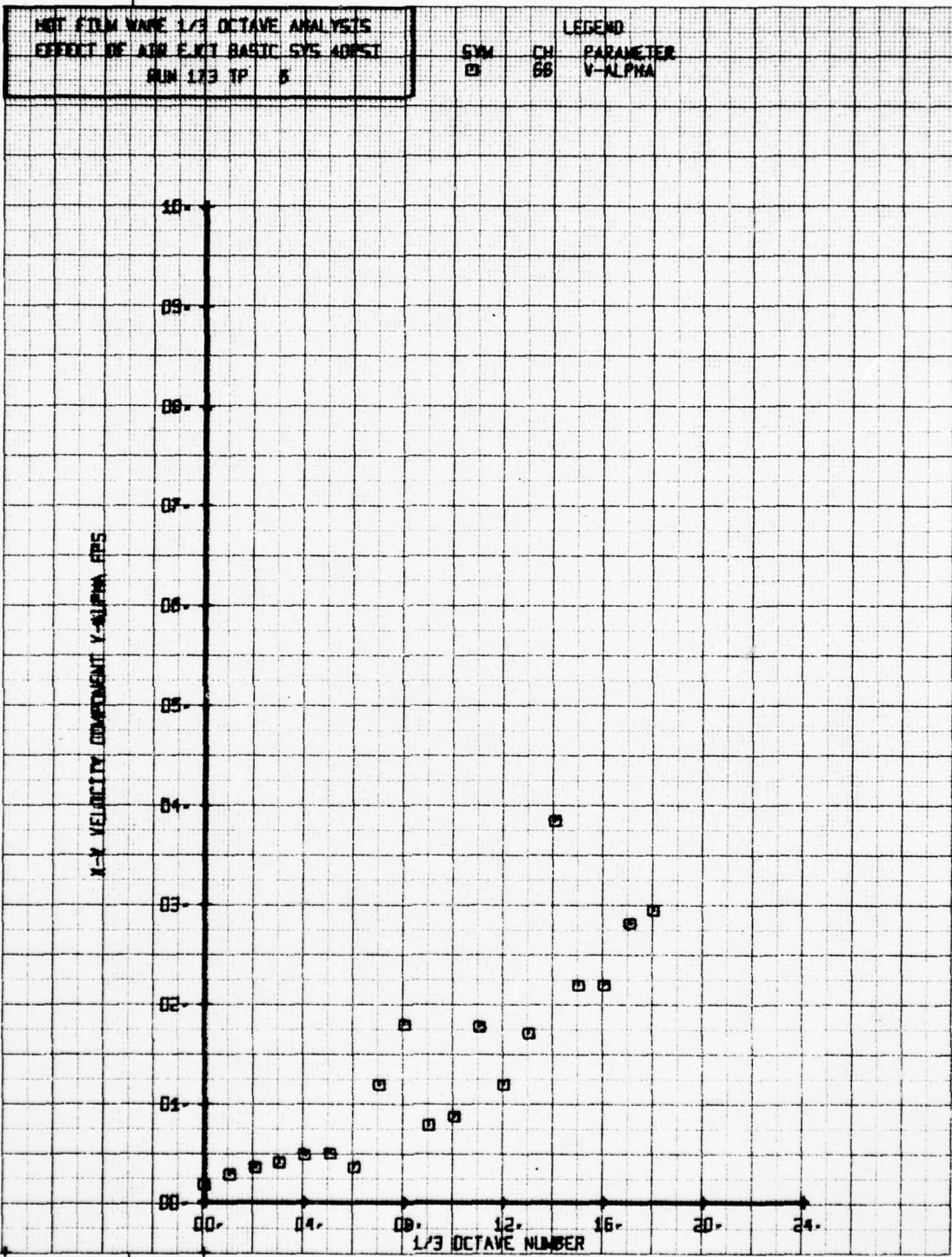


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EXIT BASIC SYS ADJUST  
RUN 173 TP 5

LEGEND  
SYM CH PARAMETER  
□ 66 V-ALPHA

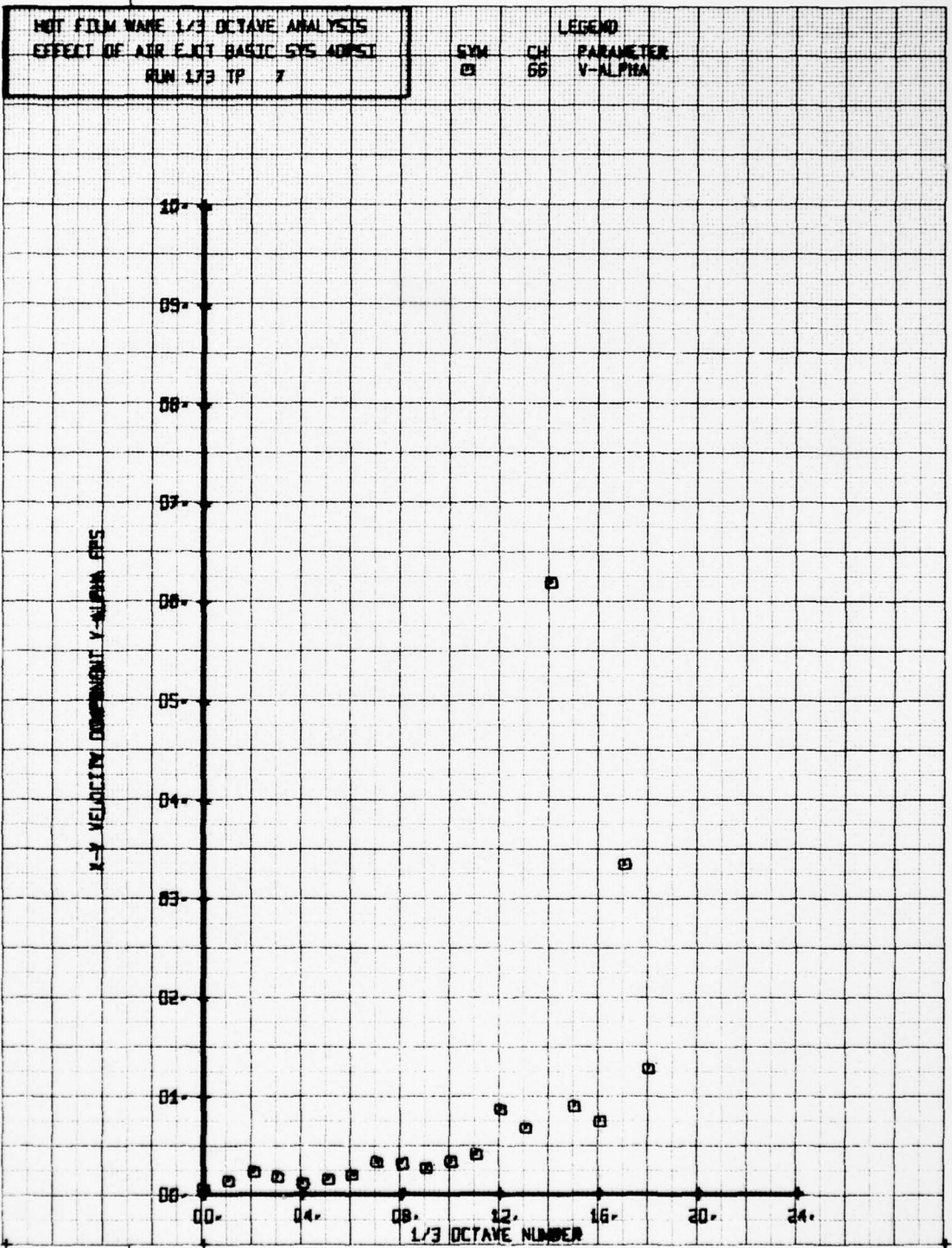






HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR FKT BASIC SYS ADPST  
RUN 173 TP 7

SYM	CH	LEGEND	PARAMETER
□	66		V-ALPHA



AD-A063 653

BOEING VERTOL CO PHILADELPHIA PA  
INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONF--ETC(U)  
SEP 78 P F SHERIDAN

F/G 1/3

DAAJ02-77-C-0020

USARTL-TR-78-23D-V4-E

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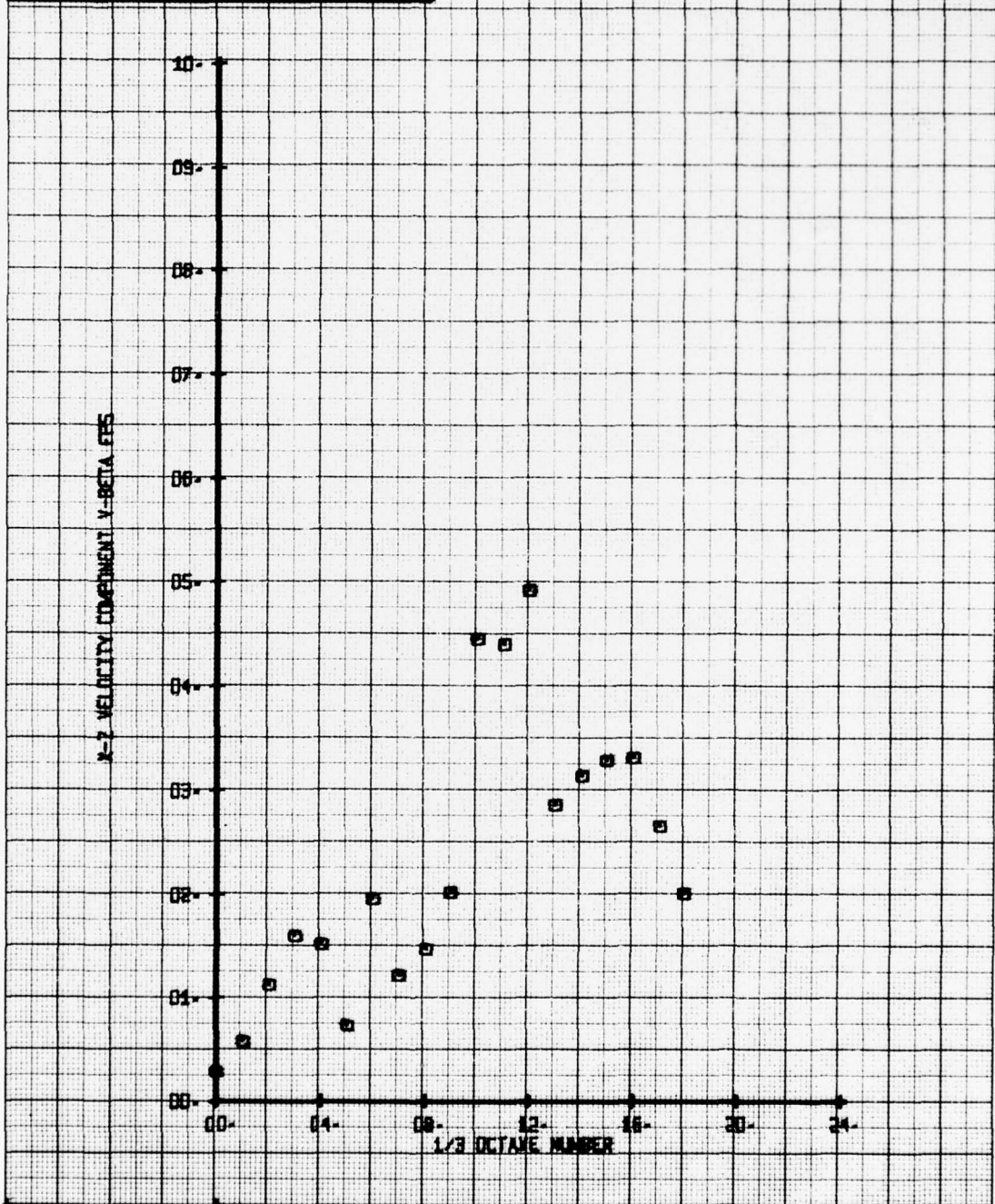
3 OF 4

AD  
A063 653



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 40PSI  
 RUN 173 TP 1

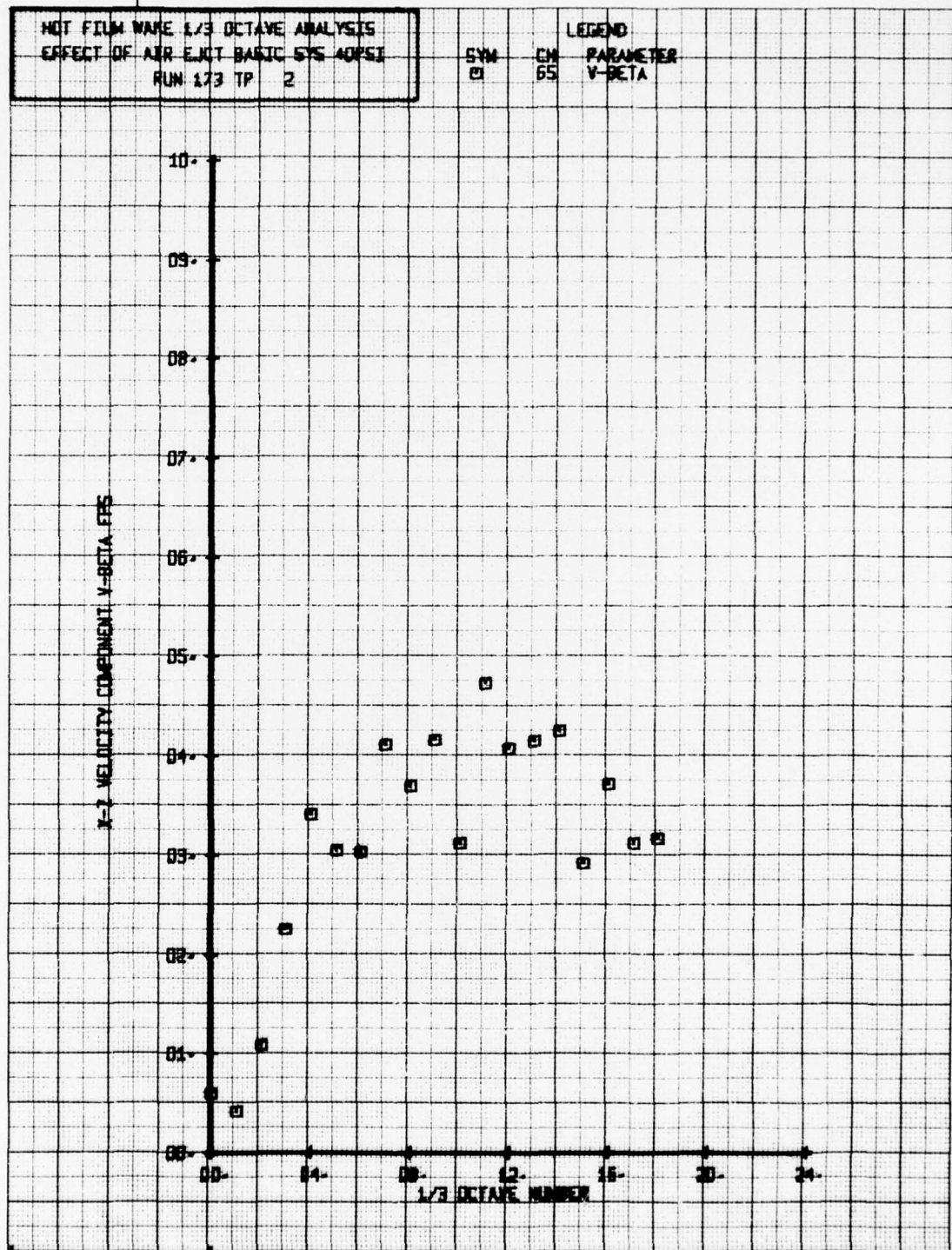
LEGEND  
 5VM 2  
 CM 65  
 PARAMETER  
 V-BETA





NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EXIT BASIC SYS ADPSI  
RUN 173 TP 2

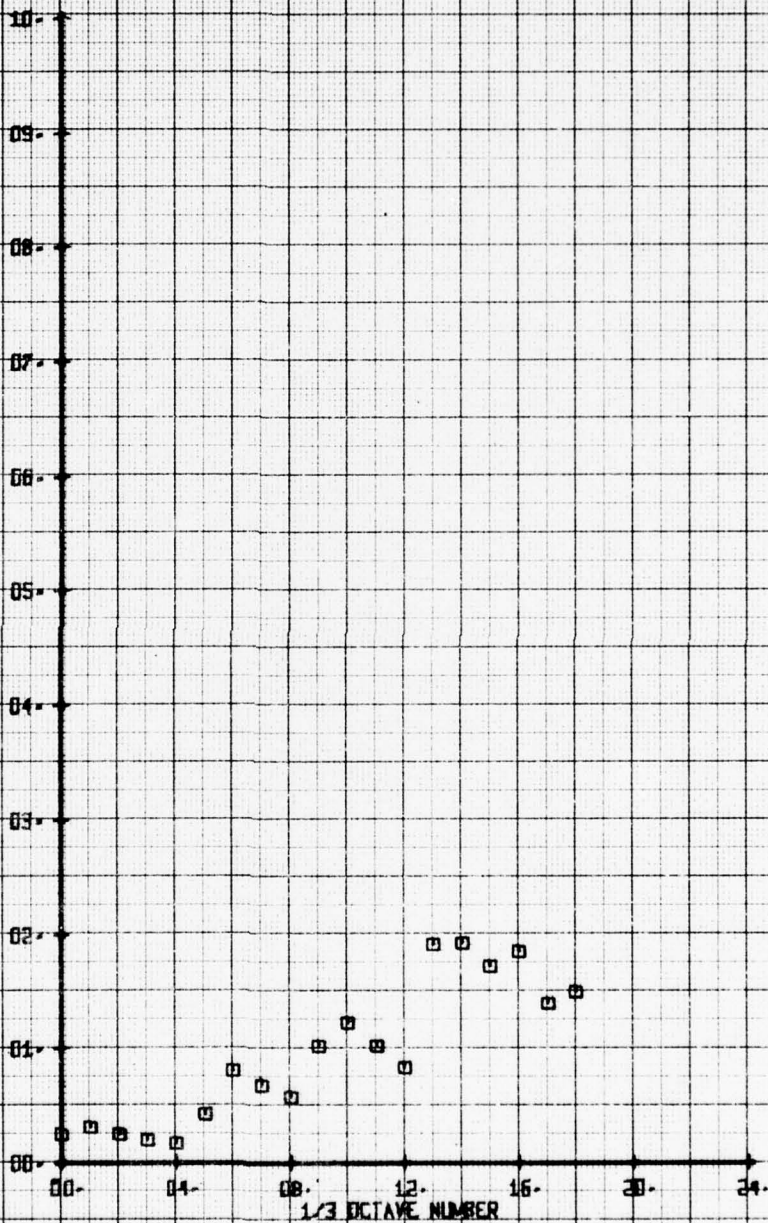
LEGEND  
SYM CM PARAMETER  
□ 65 V-BETA



FOR FILM NAME 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR CRY BASIC SYS ADPST  
 RUN 173 TP 3

SYM	CH	PARAMETER
□	65	V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



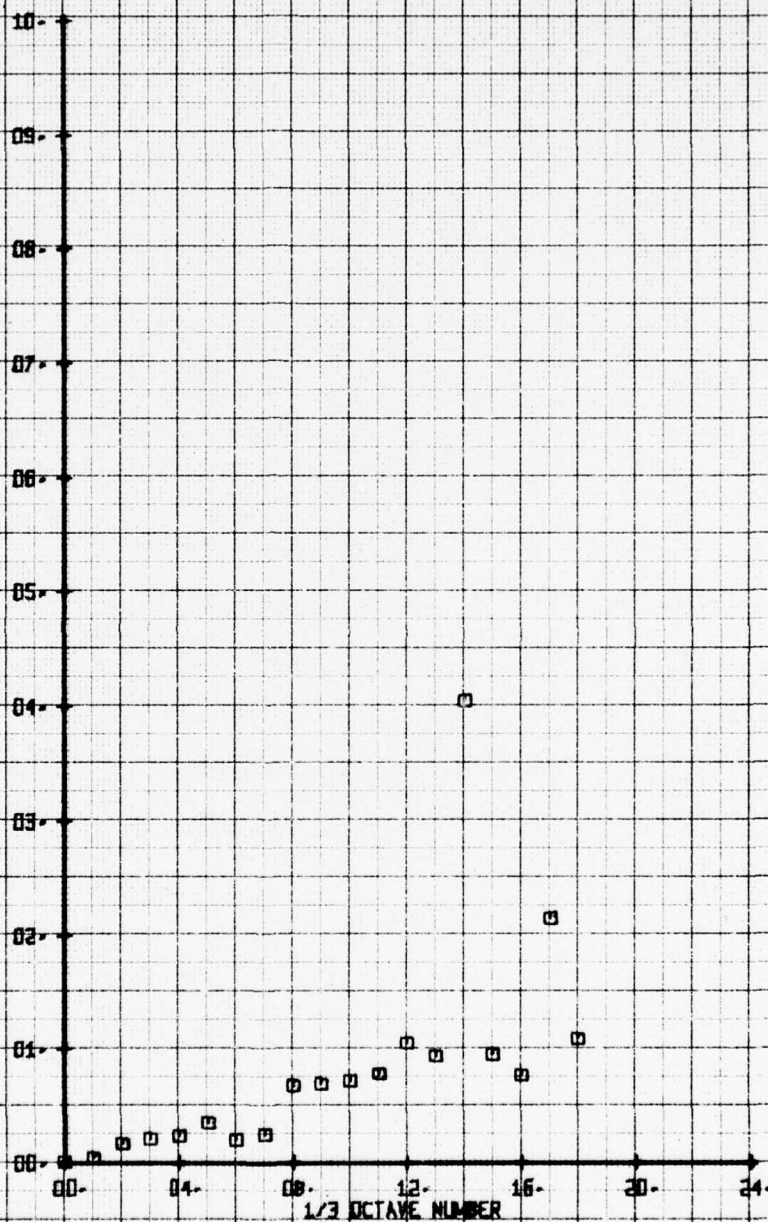
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 40P51  
RUN 173 TP 4

SWM  
□

CH  
65

LEGEND  
PARAMETER  
V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS

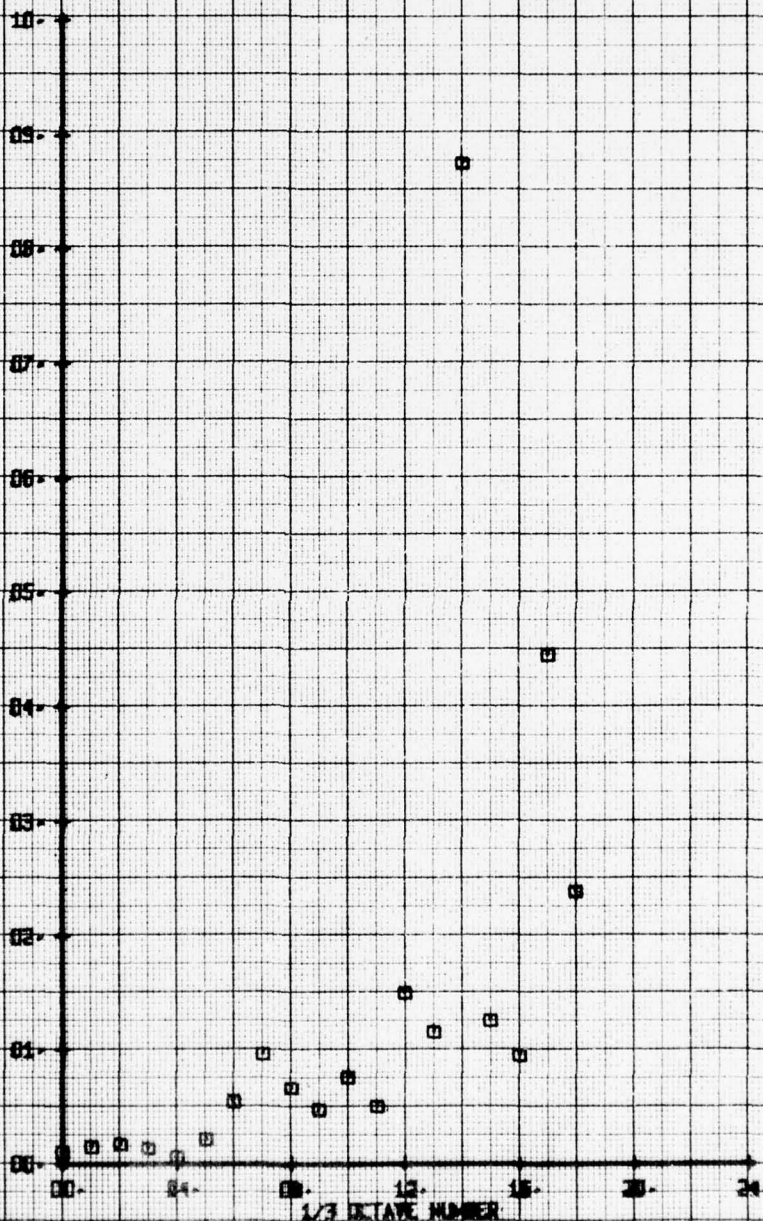




NOT FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS AORST  
RUN 173 TP 5

SYM CN  
□ 65  
LEGEND  
PARAMETER  
V-BETA

2-2 VELOCITY COMPONENT V-BETA (PS)

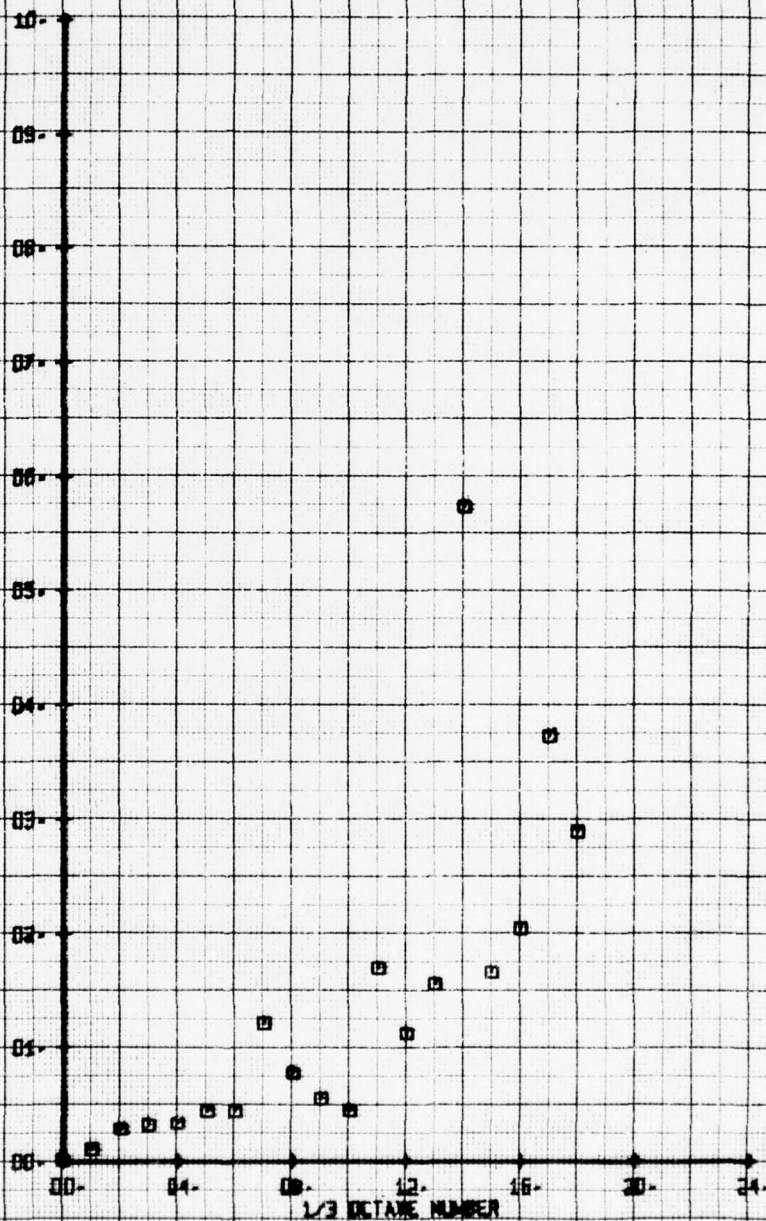




NET FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS ADPST  
RUN 179 TP 5

SYM CH PARAMETER  
□ 65 V-BETA

X-2 VELOCITY COMPONENT V-BETA SYS



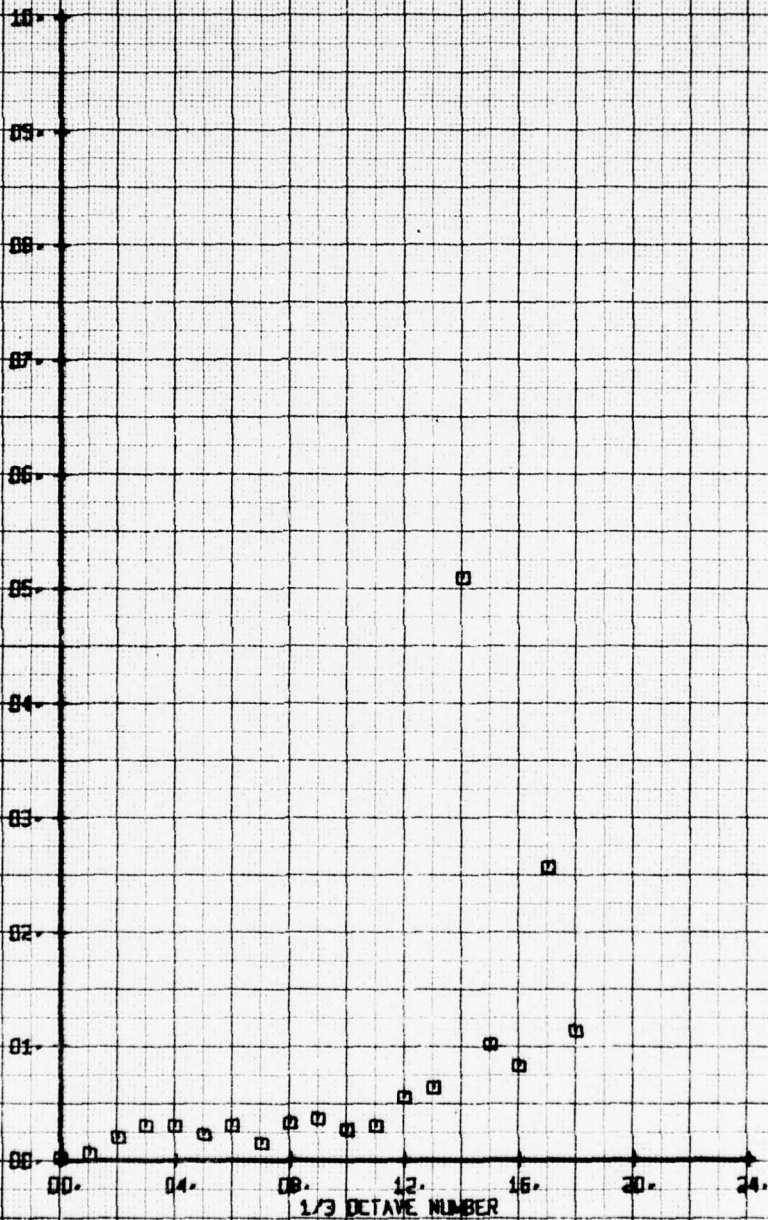
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR C-JT BASIC SYS ADPST  
RPM 173 TP 7

SYM  
□

CH  
55

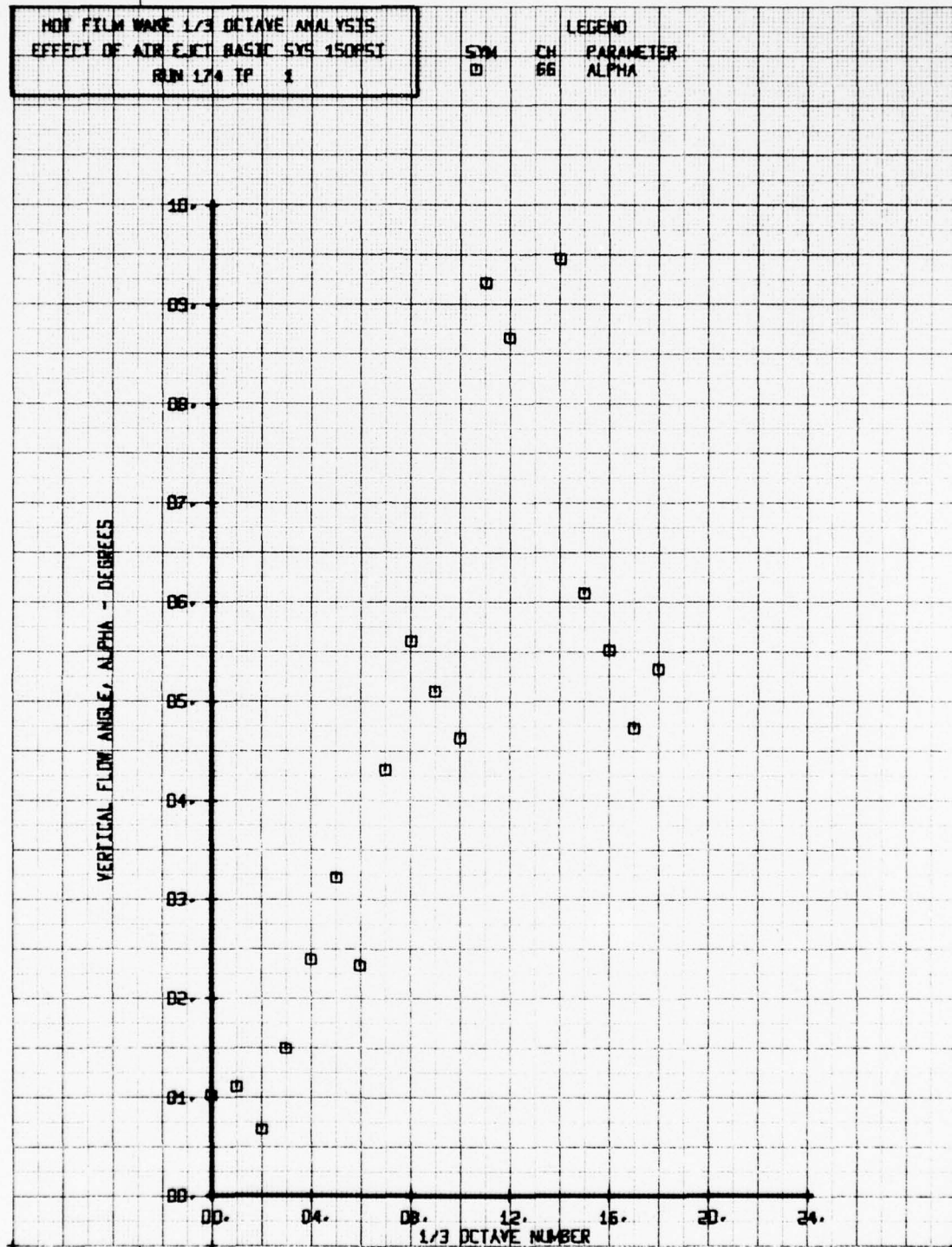
LEGEND  
PARAMETER  
V-BETA

X-2 VELOCITY COMPONENT V-BETA FFS



NOV FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 150PST  
RUN 174 IP 1

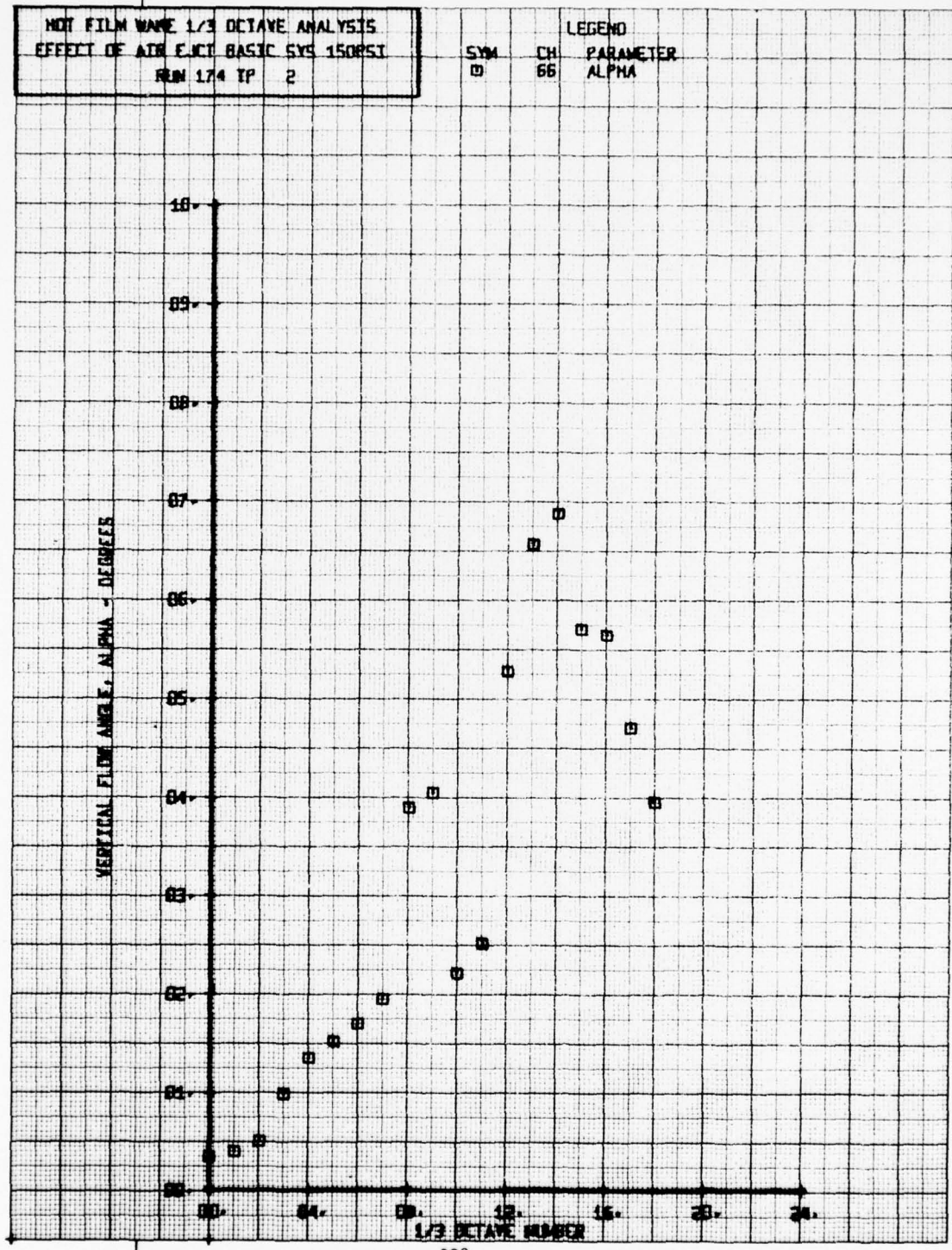
LEGEND  
SYM CH PARAMETER  
□ 66 ALPHA





NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 150PSI  
 RUN 174 TP 2

LEGEND  
 SYM CH PARAMETER  
 □ 66 ALPHA





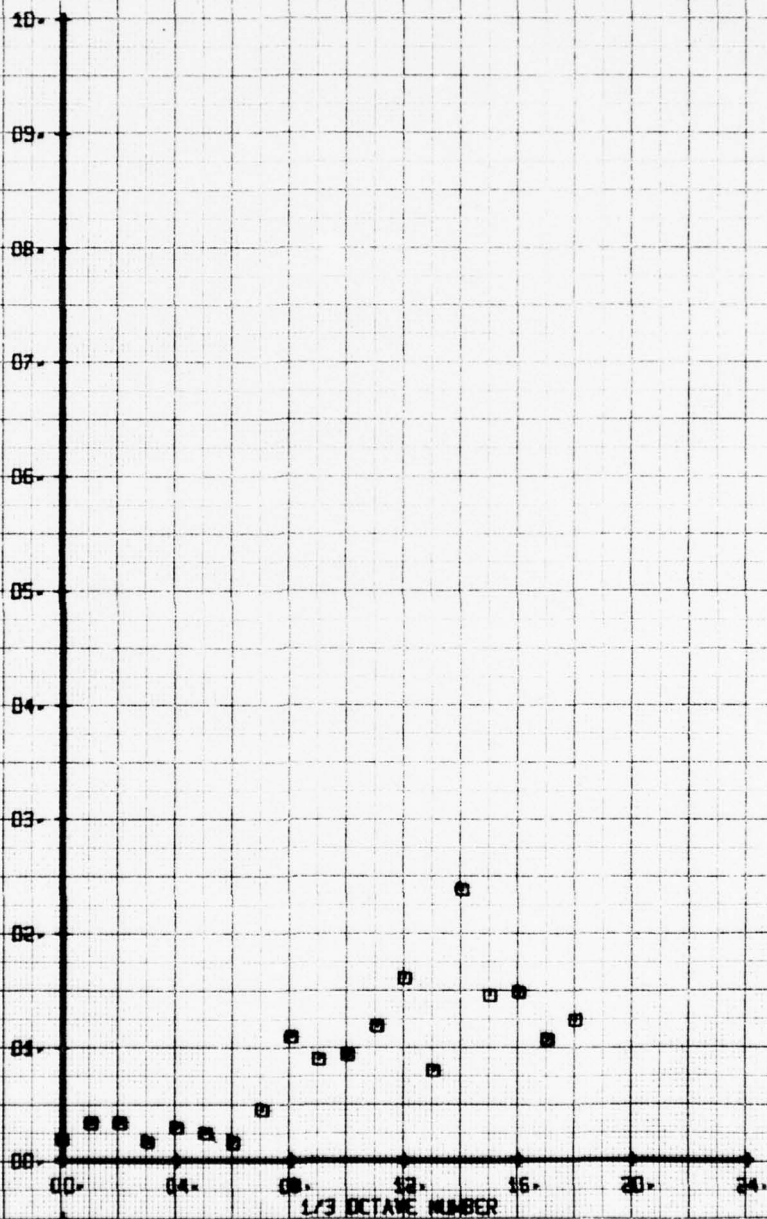
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR ENCL BASIC SYS 150PSI  
RUN 174 TP 3

SYM  
□

CH  
66

LEGEND  
PARAMETER  
ALPHA

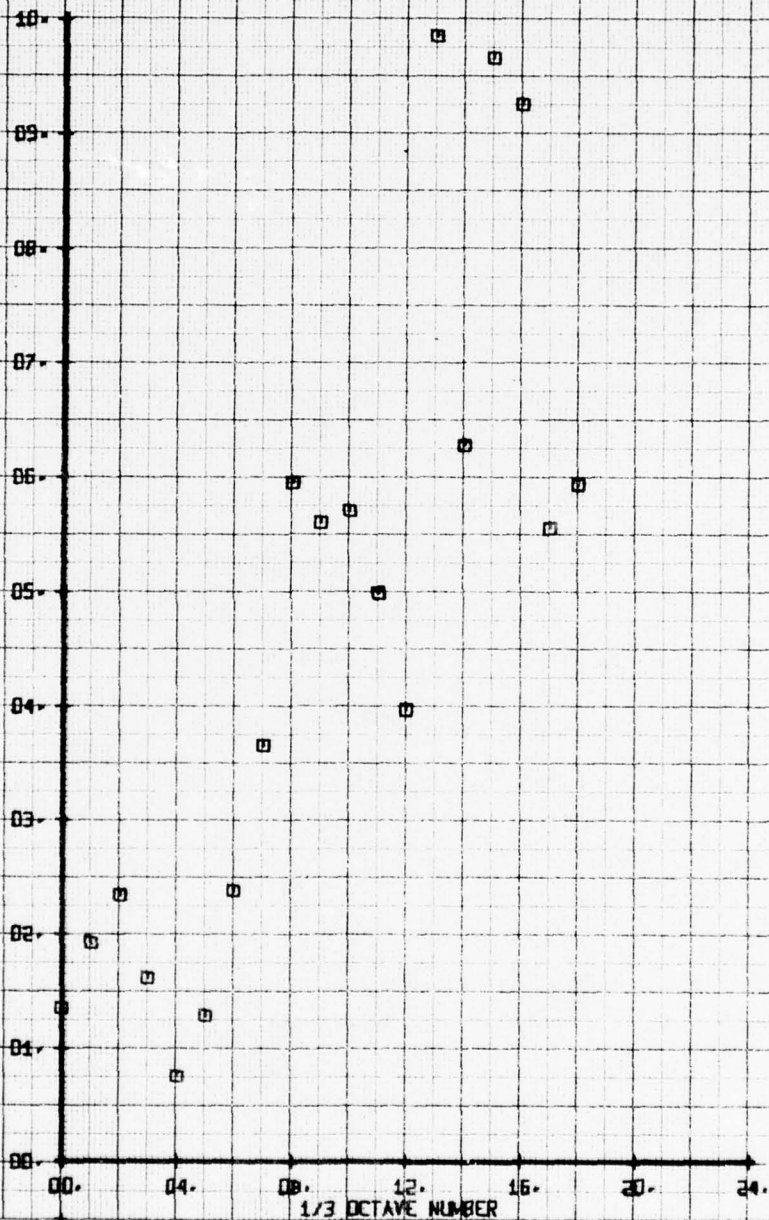
VERTICAL FLOW ANGLE, ALPHA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 150PSI  
 RUN 174 TP 1

SYN CH  
 0 65  
 LEGEND  
 PARAMETER  
 BETA

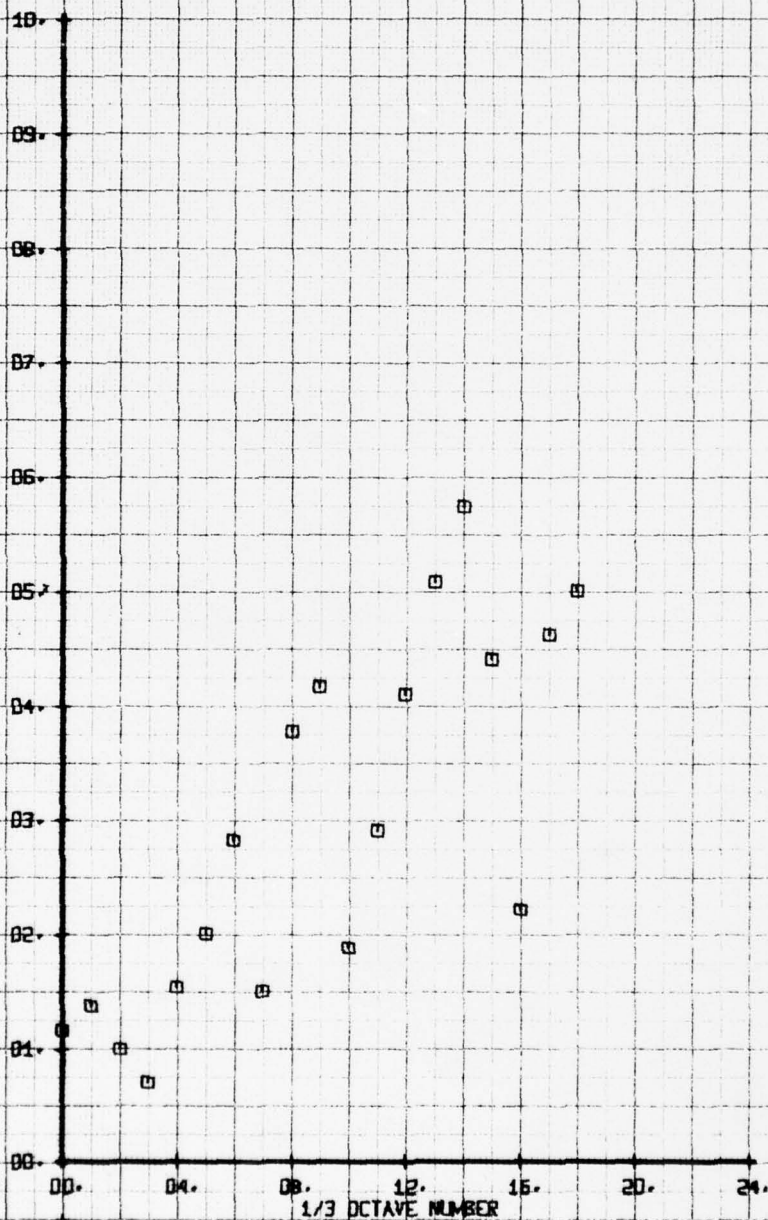
LATERAL FLOW ANGLE, BETA - DEGREES



NOI FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EXIT BASIC SYS 150PSI  
RUN 174 TP 2

SYM	CH	LEGEND
□	65	PARAMETER BETA

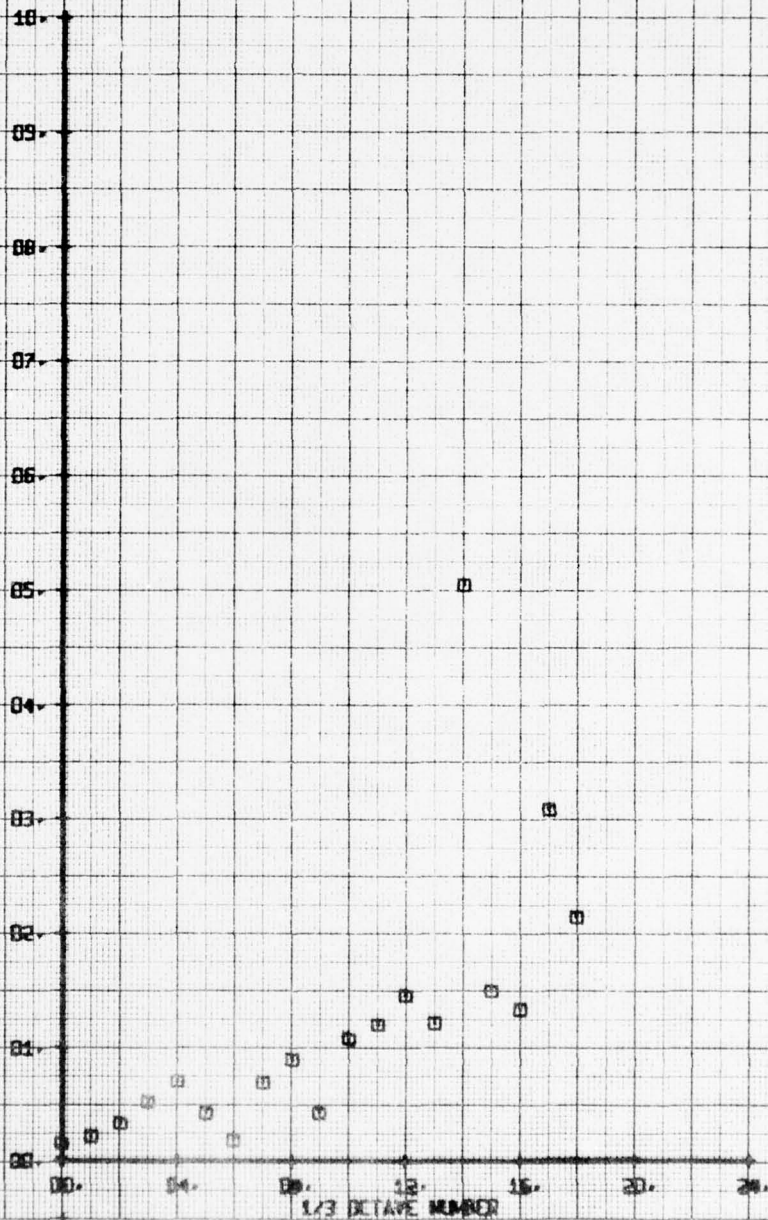
LATERAL FLOW ANGLE, BETA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT BASIC SYS 150PST  
RUN 174 IP 3

LEGEND	
SYM	CH
□	65
	PARAMETER
	BETA

LATERAL FLOW ANGLE, BETA - DEGREES





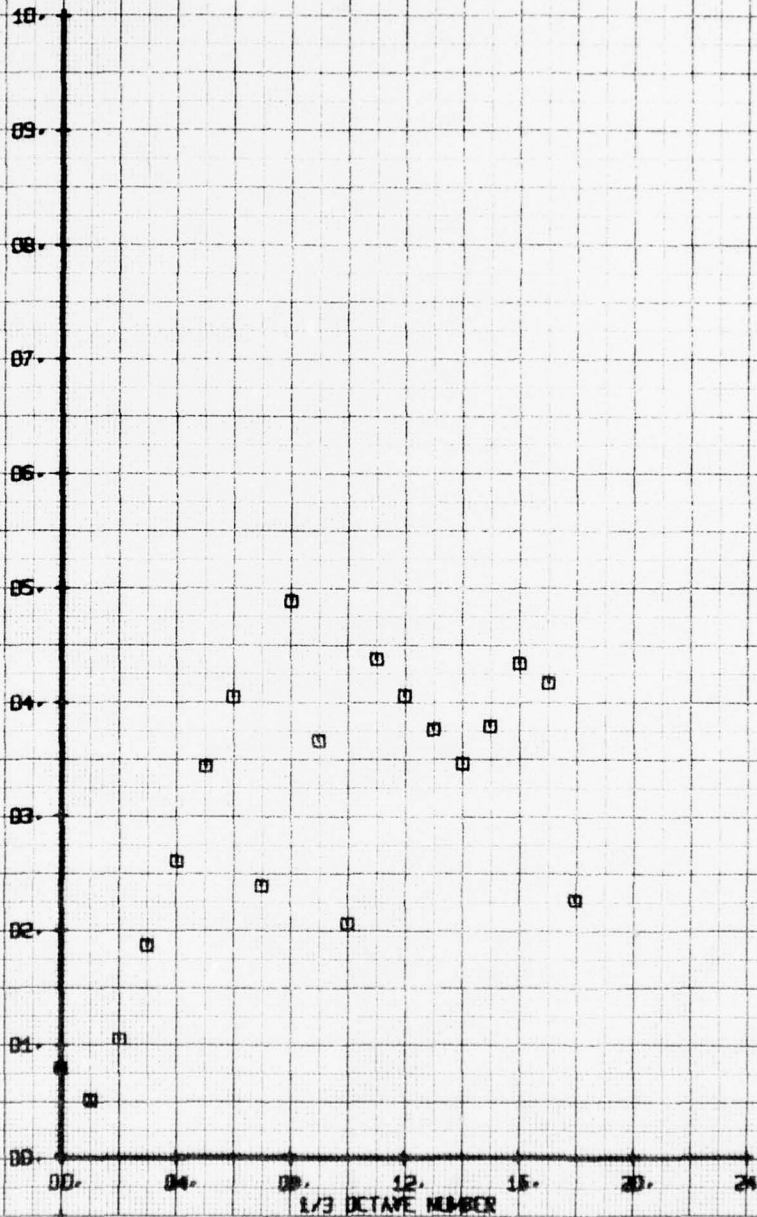
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 150PSI  
 RUN 174 TP 1

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

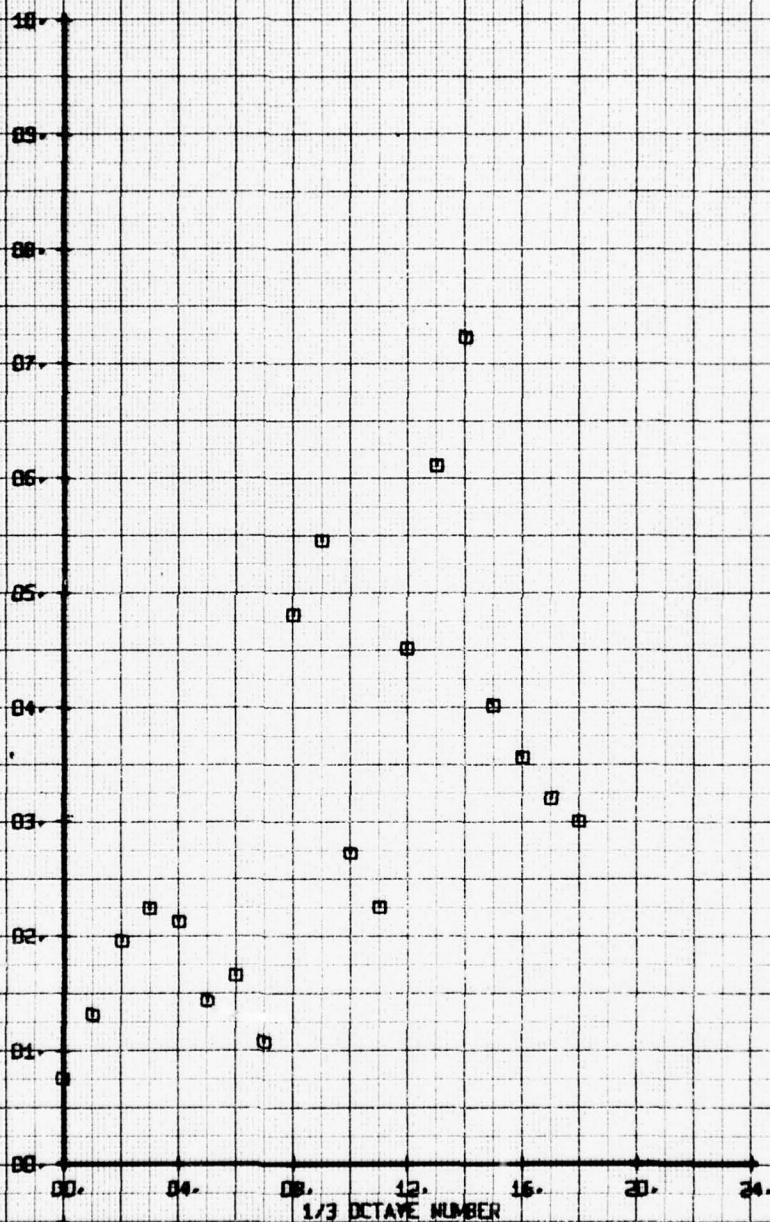
X-Y VELOCITY COMPONENT V-ALPHA FPS



NOI FILM NAME 1/3 OCTAVE ANALYSIS  
EFFECT OF ATM ENVI BASIC SYS 150R51  
REM 174 TP 2

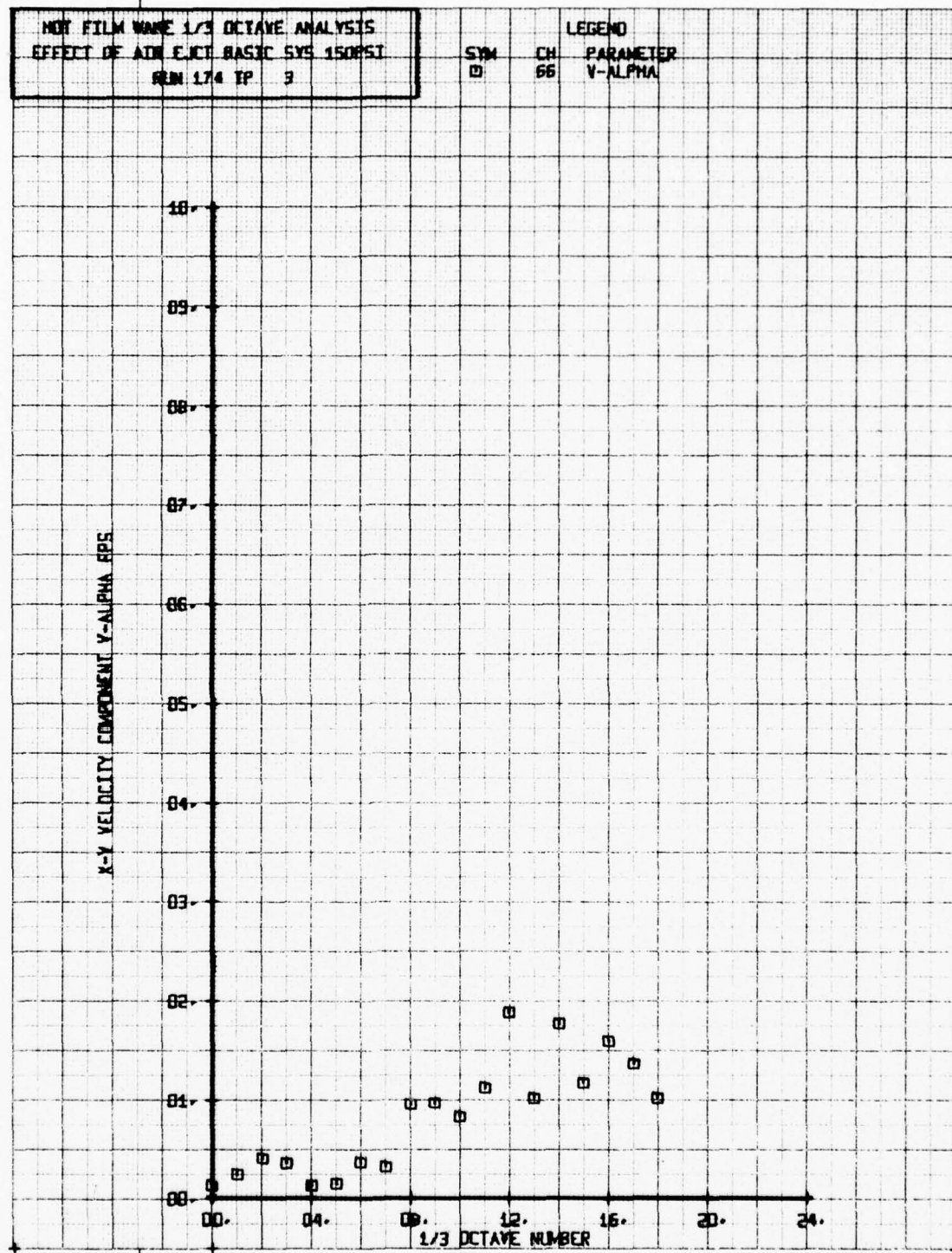
SYN CH PARAMETER  
0 66 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA RPS



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 150PSI  
 RUN 174 IP 3

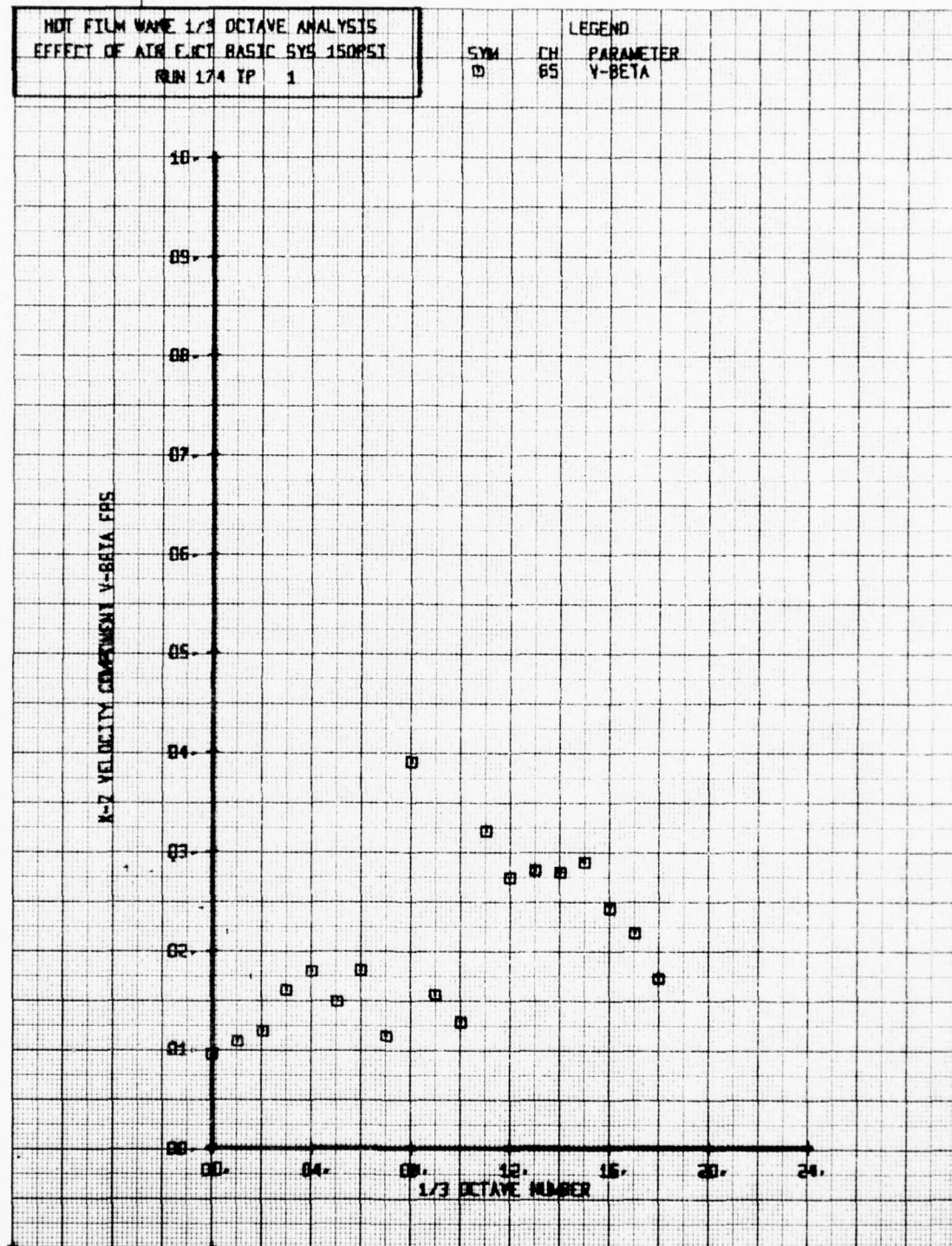
LEGEND  
 CH 66  
 PARAMETER  
 V-ALPHA





NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS 150RST  
 RUN 174 TP 1

LEGEND	
SYM	CH
D	65
PARAMETER	
V-BETA	

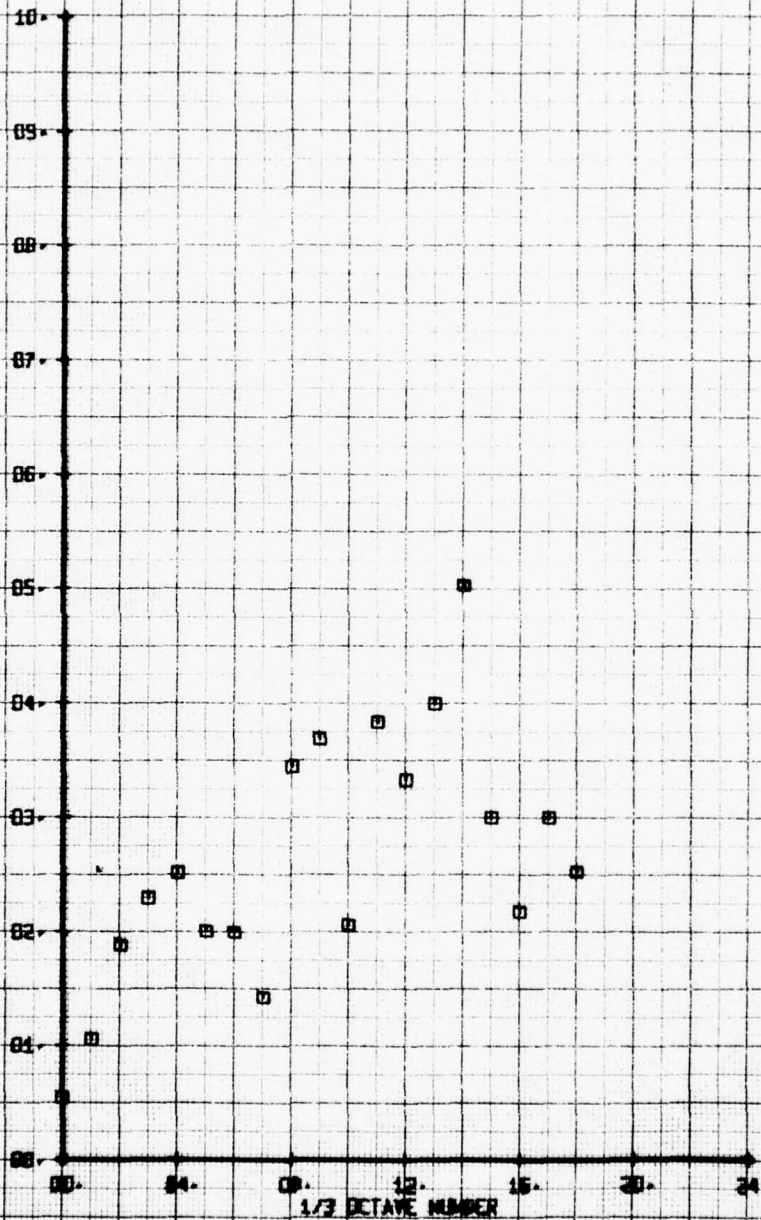




MOR FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT BASIC SYS 150PSI  
 RUN 174 TP 2

SYM	CH	LEGEND
□	65	PARAMETER V-BETA

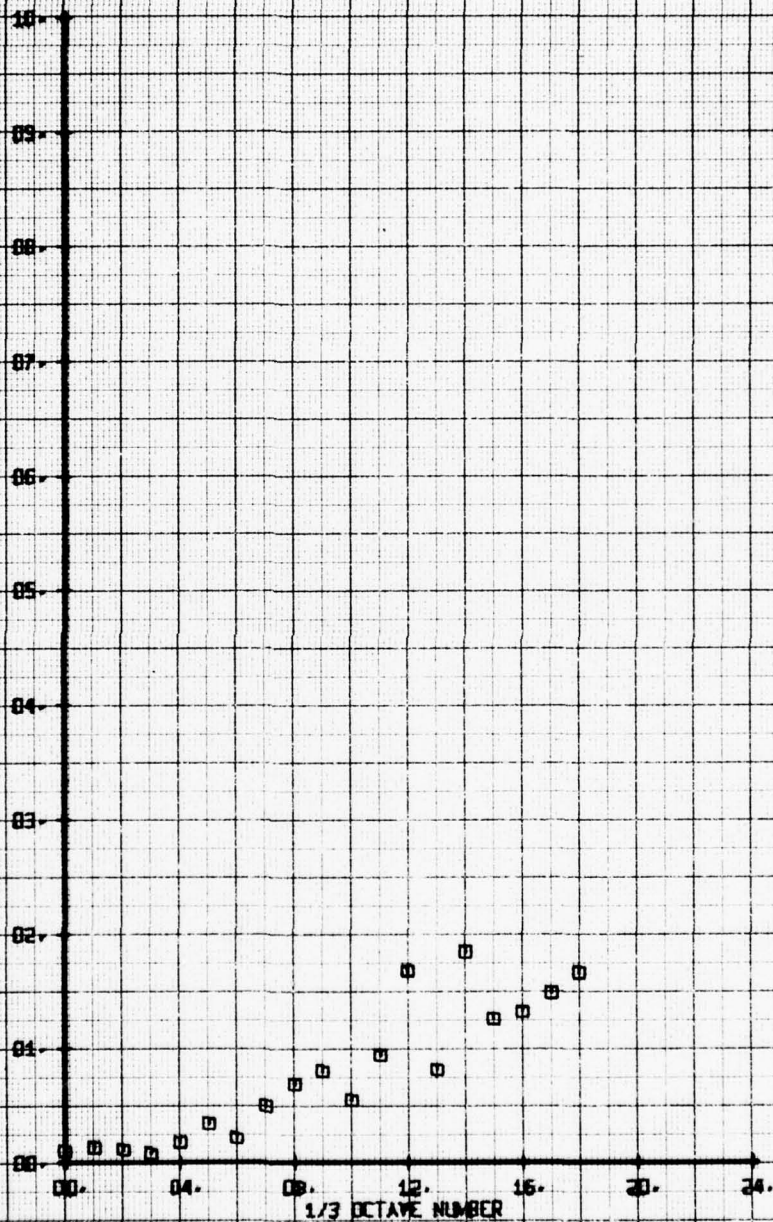
X-Z VELOCITY COMPONENT V-BETA FFS



HIR FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW BASIC SYS 150RST  
 RUN 174 IP 3

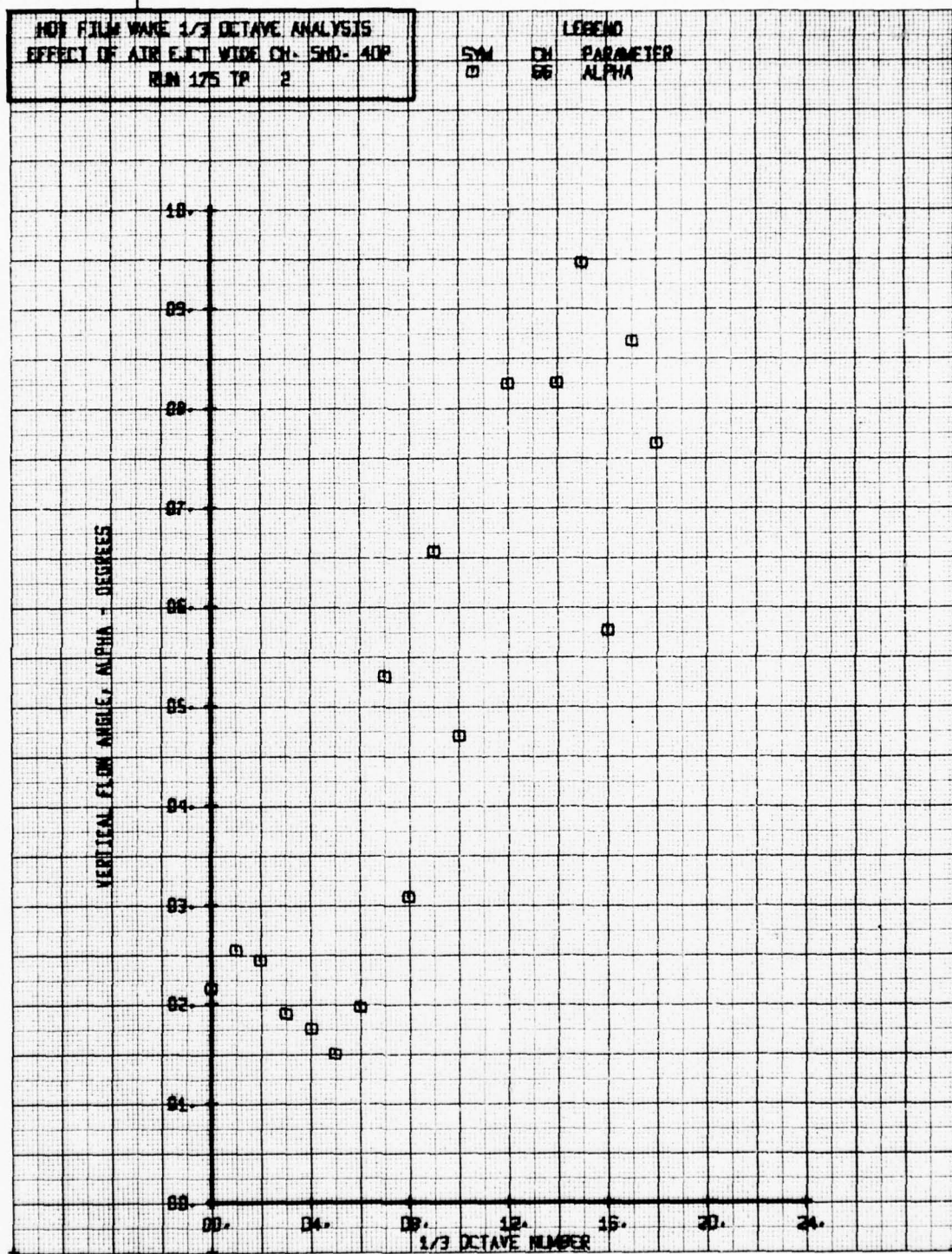
LEGEND  
 CH 65  
 PARAMETER  
 Y-BETA

X-2 VELOCITY COMPONENT Y-BETA FBS



NOT FILM WARE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT WIDE CH- 5MD- 40P  
RUN 175 TP 2

SYN CH  
□ 56  
PARAMETER  
ALPHA



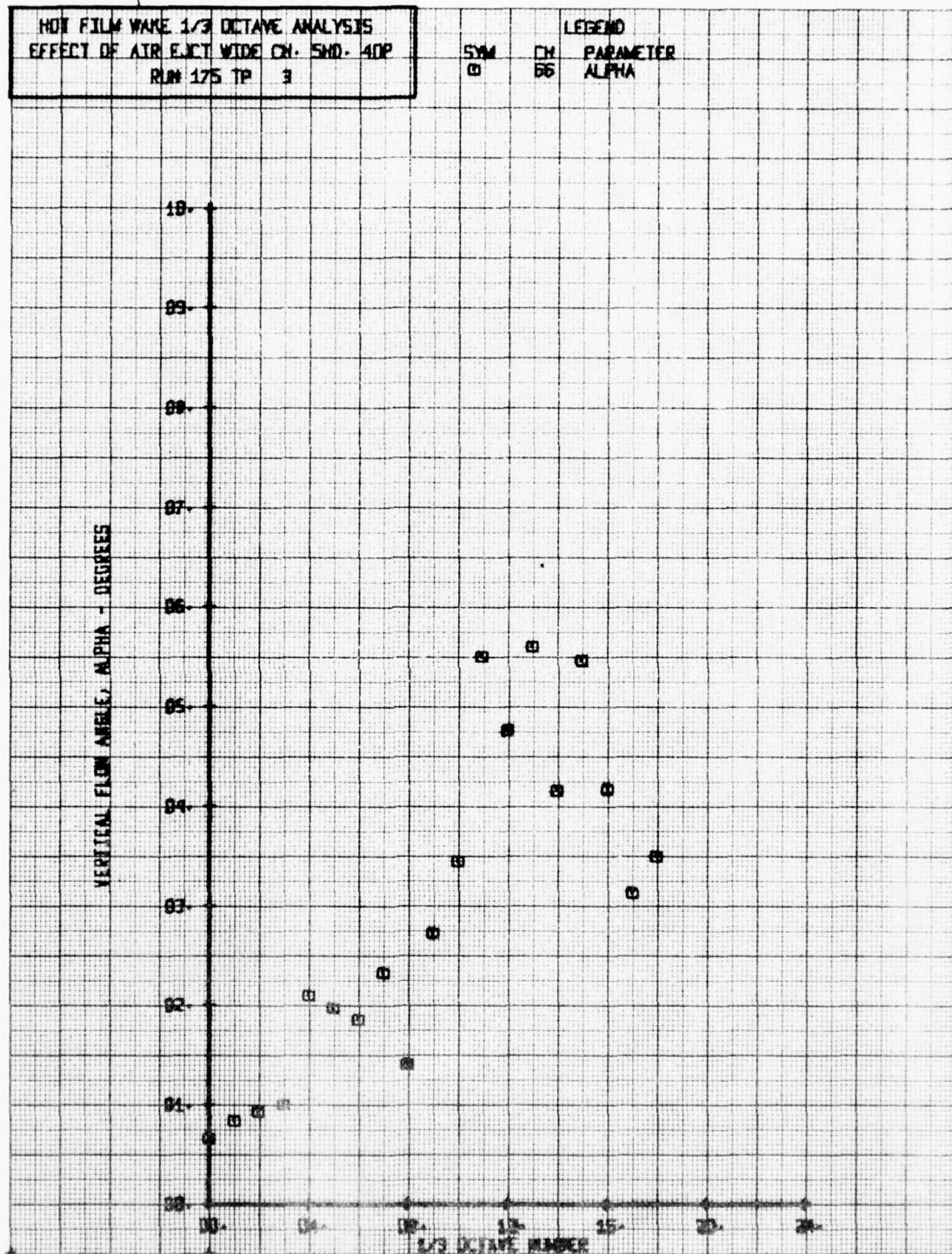


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT WIDE CH. 5ND. 4DP  
RUN 175 TP 3

SYM  
O

CH  
56

LEGEND  
PARAMETER  
ALPHA





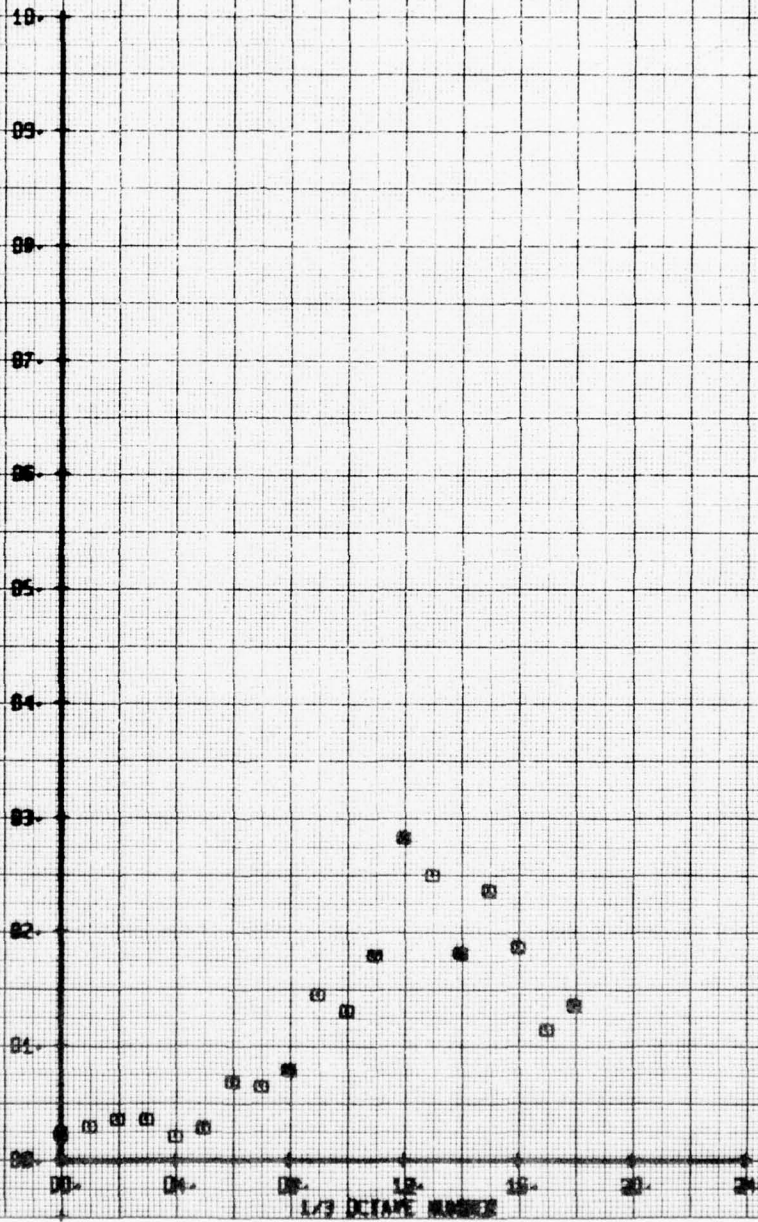
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT WIDE CH. SMO. 40P  
RUN 175 TP 4

SYM  
□

CH  
56

LEGEND  
PARAMETER  
ALPHA

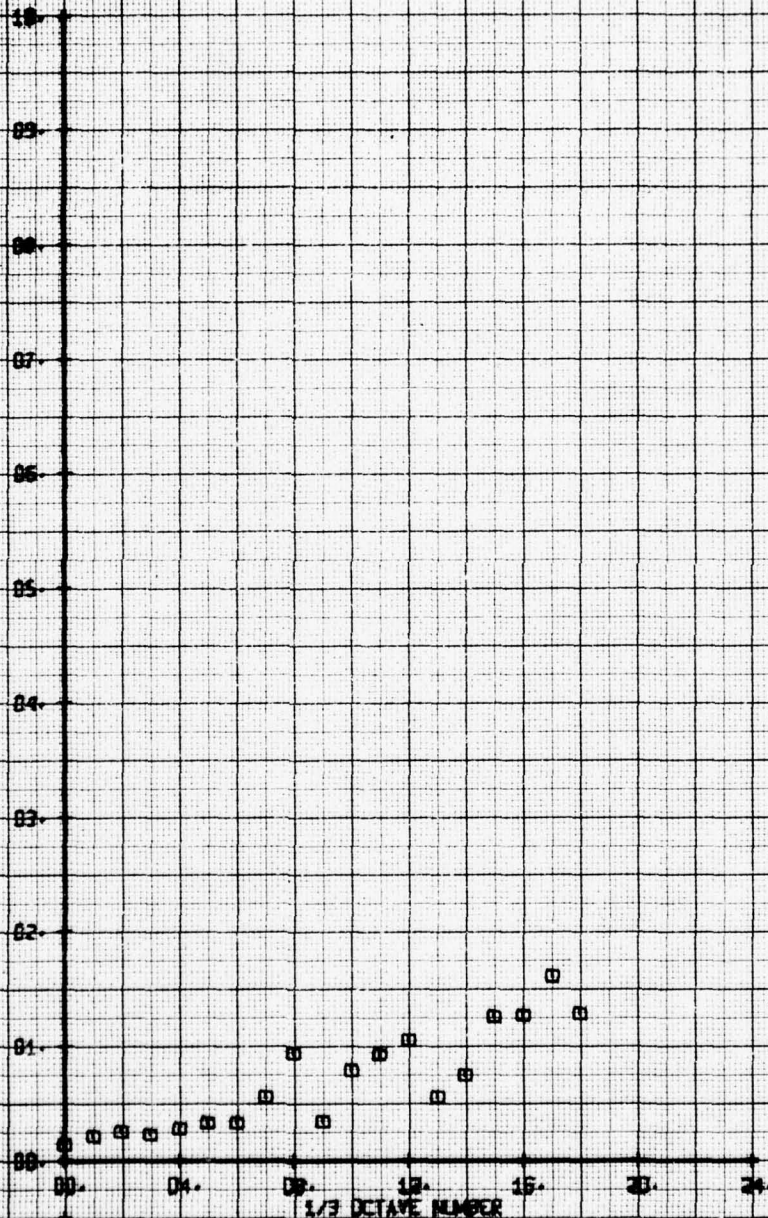
VERTICAL FLOW ANGLE, ALPHA - DEGREES



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE CN. 540-40P  
 RUN 175 TP 5

LEGEND  
 SW CN PARAMETER  
 0 66 ALPHA

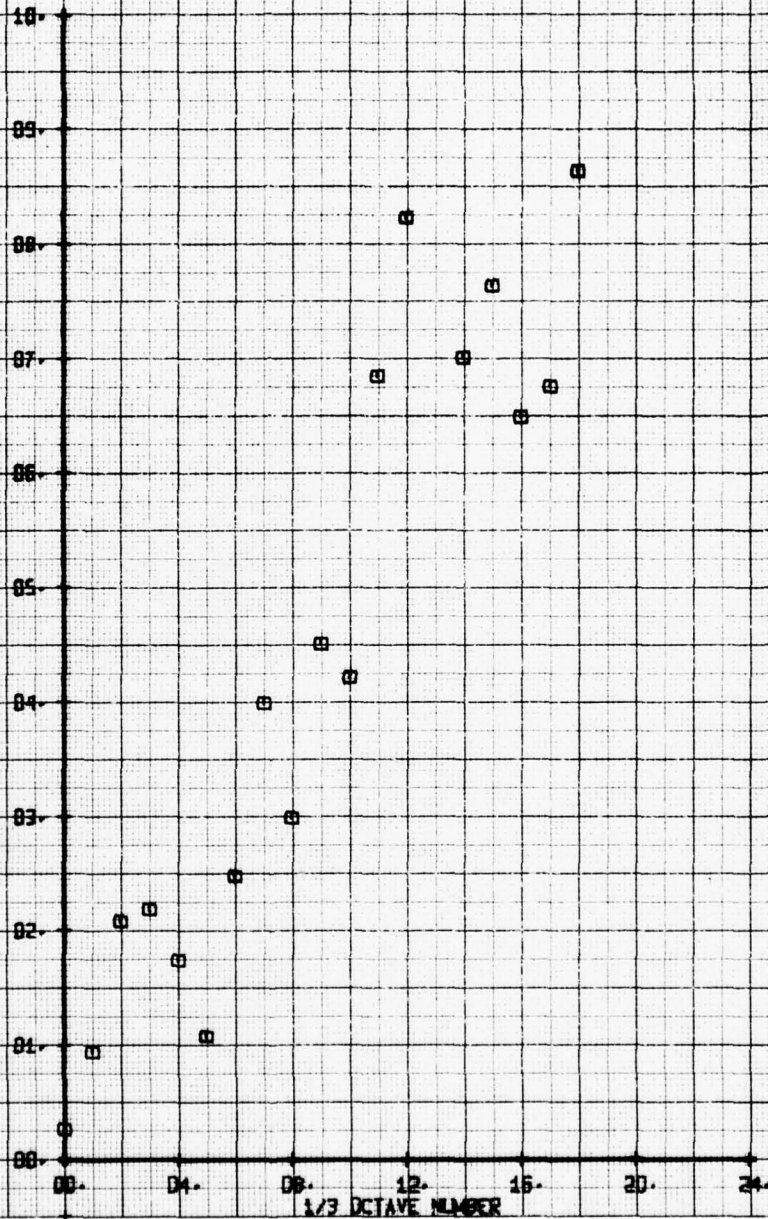
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR JET WIDE CH. SHD. 40P  
 RUN 175 TP 2

SYM CH  
 0 65  
 LEGEND  
 PARAMETER  
 BETA

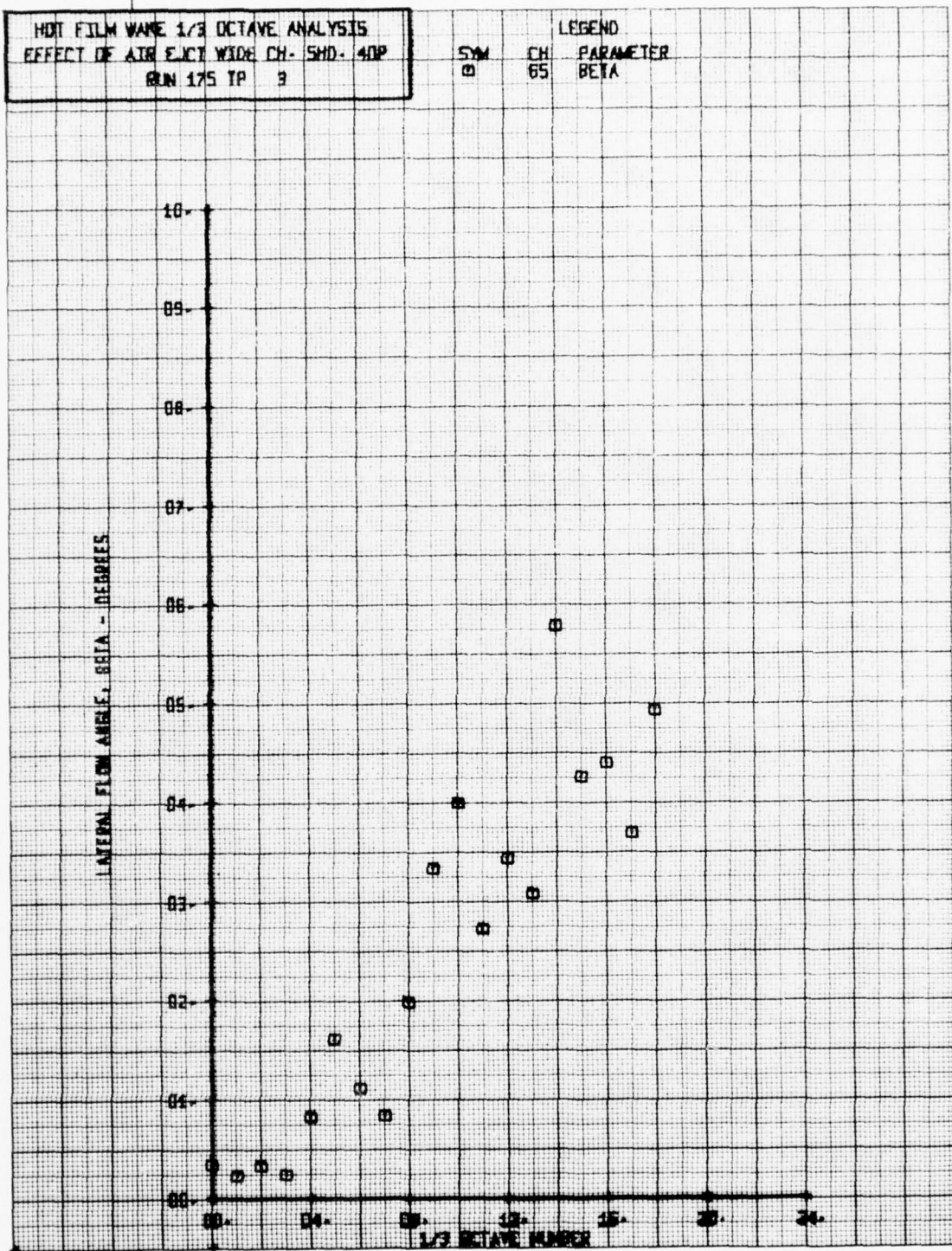
LATERAL FLOW ANGLE, BETA - DEGREES





MDI FILM WAVE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR FLOW WIDE CH. SHD. 40P  
RUN 175 TP 3

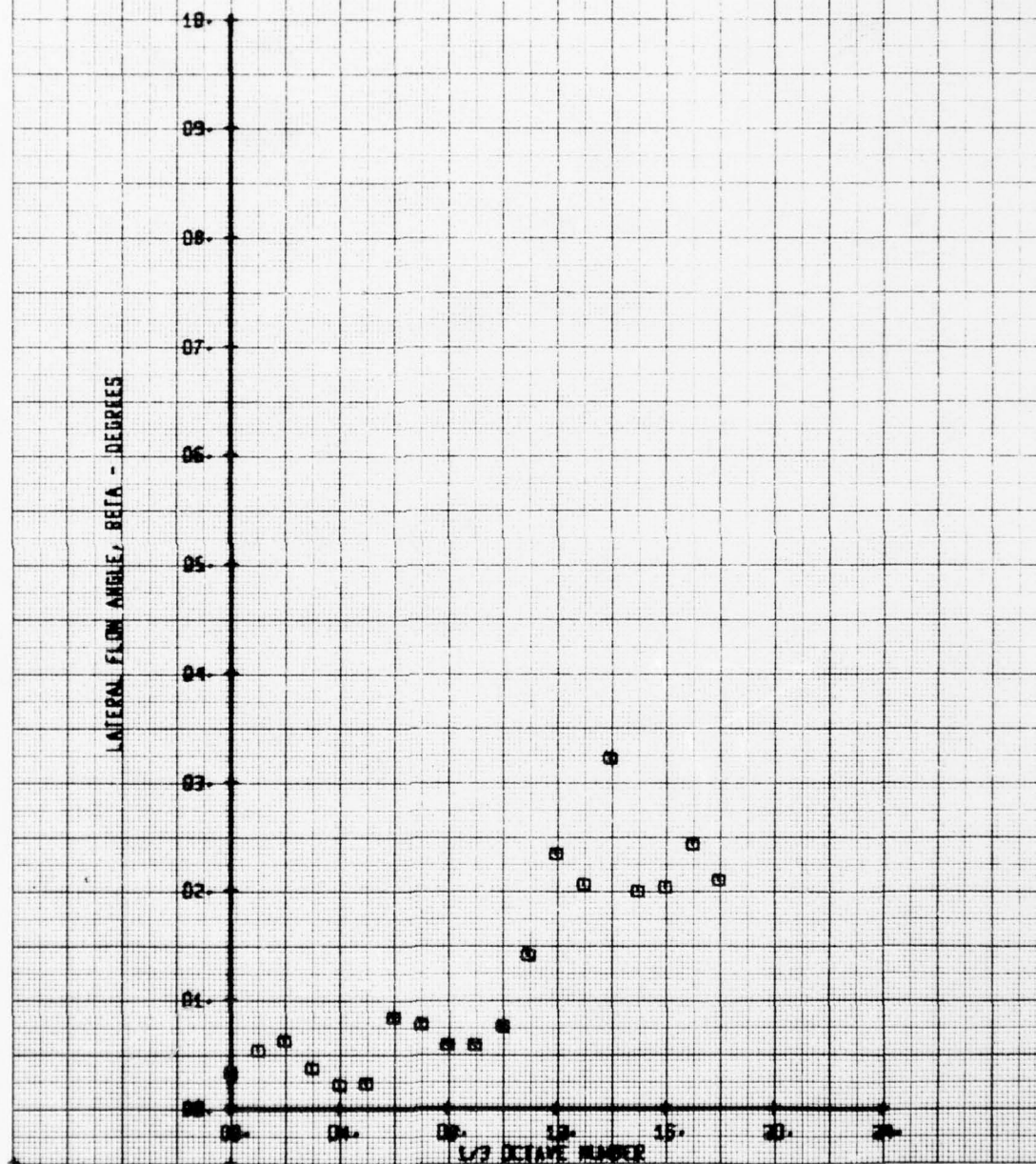
SYM	CH	LEGEND
□	65	PARAMETER BETA





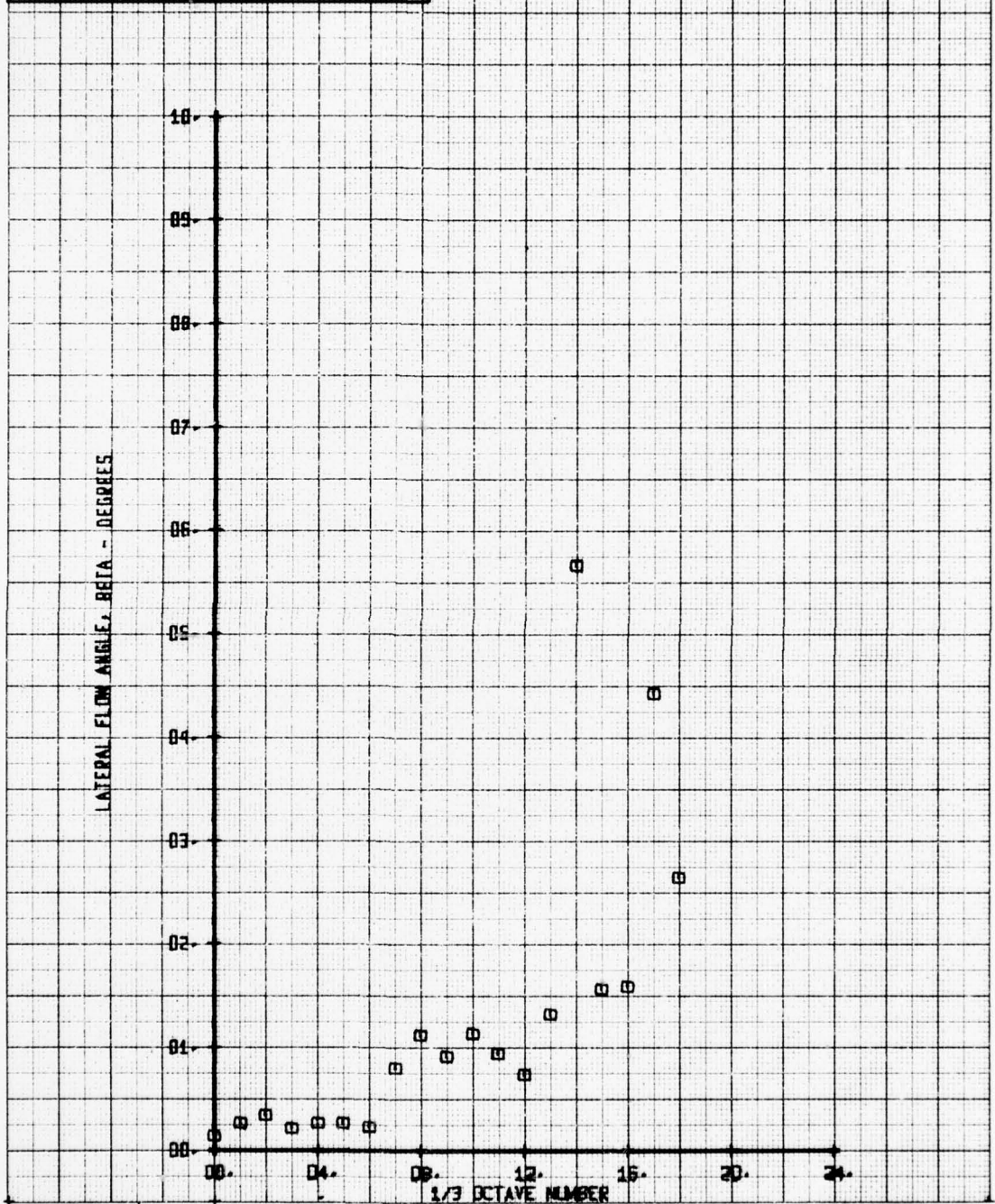
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT WIDE ON. SHD. 40P  
RUN 175 TP 4

LEGEND	
SYM	PARAMETER
□	BETA



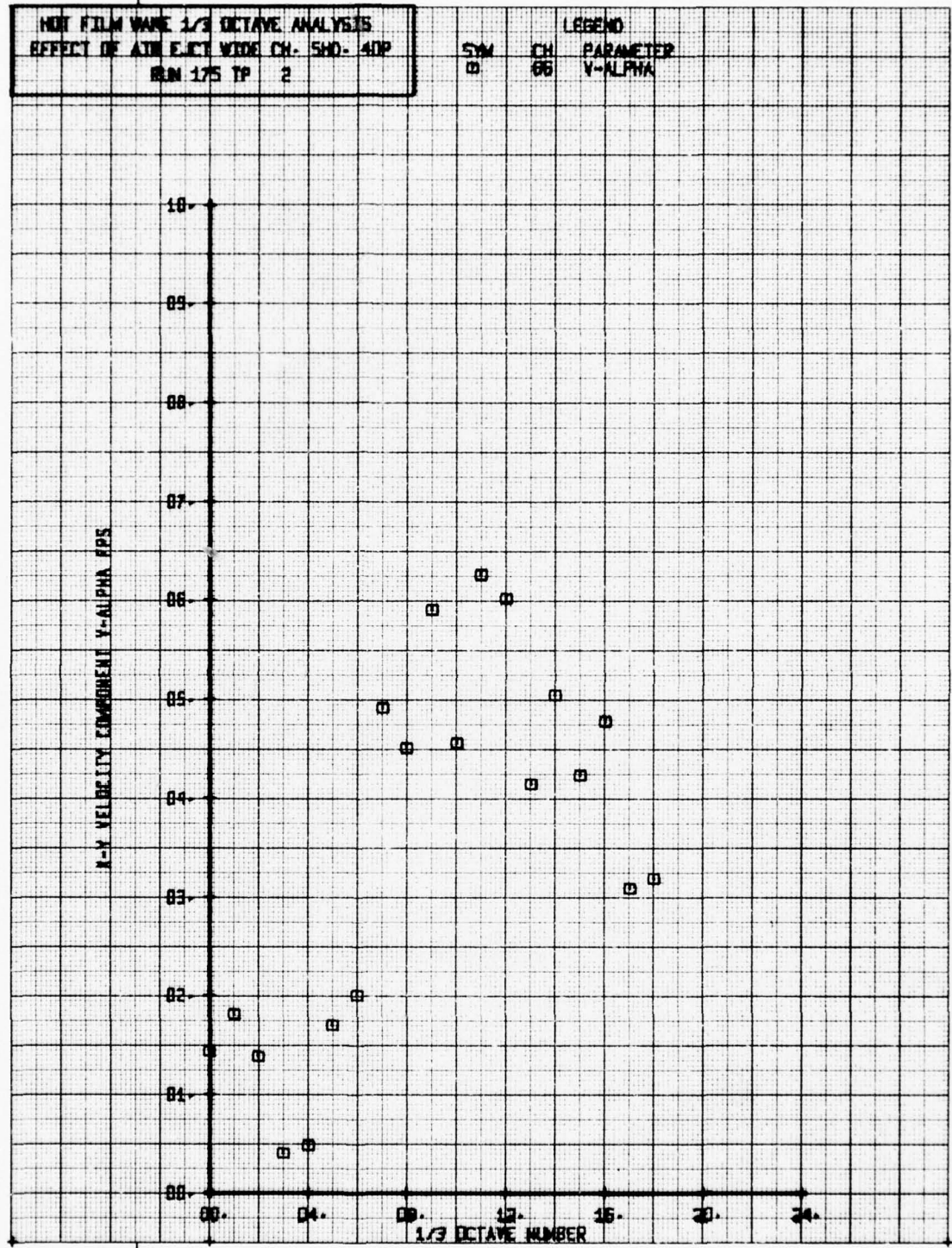
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE CH. SHD- 40P  
 RUN 175 TP 5

SYM	CH	PARAMETER
□	65	BETA



NEW FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR FLOW WIDE CH. 500-40P  
 RUN 175 TP 2

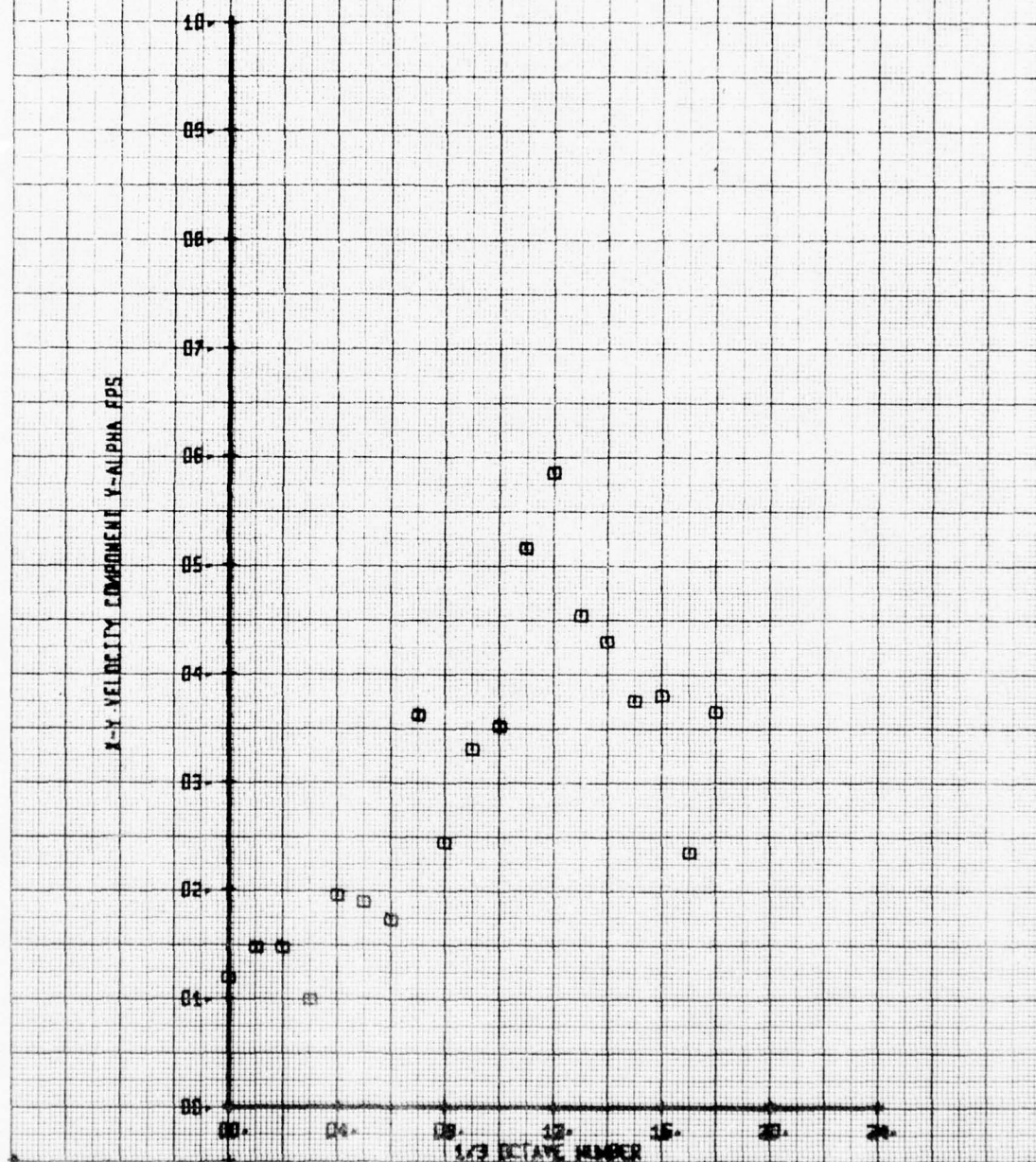
LEGEND  
 CH 06  
 PARAMETER  
 V-ALPHA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR EJECT WIDE CH. SHD. 40P  
RUN 175 TP 3

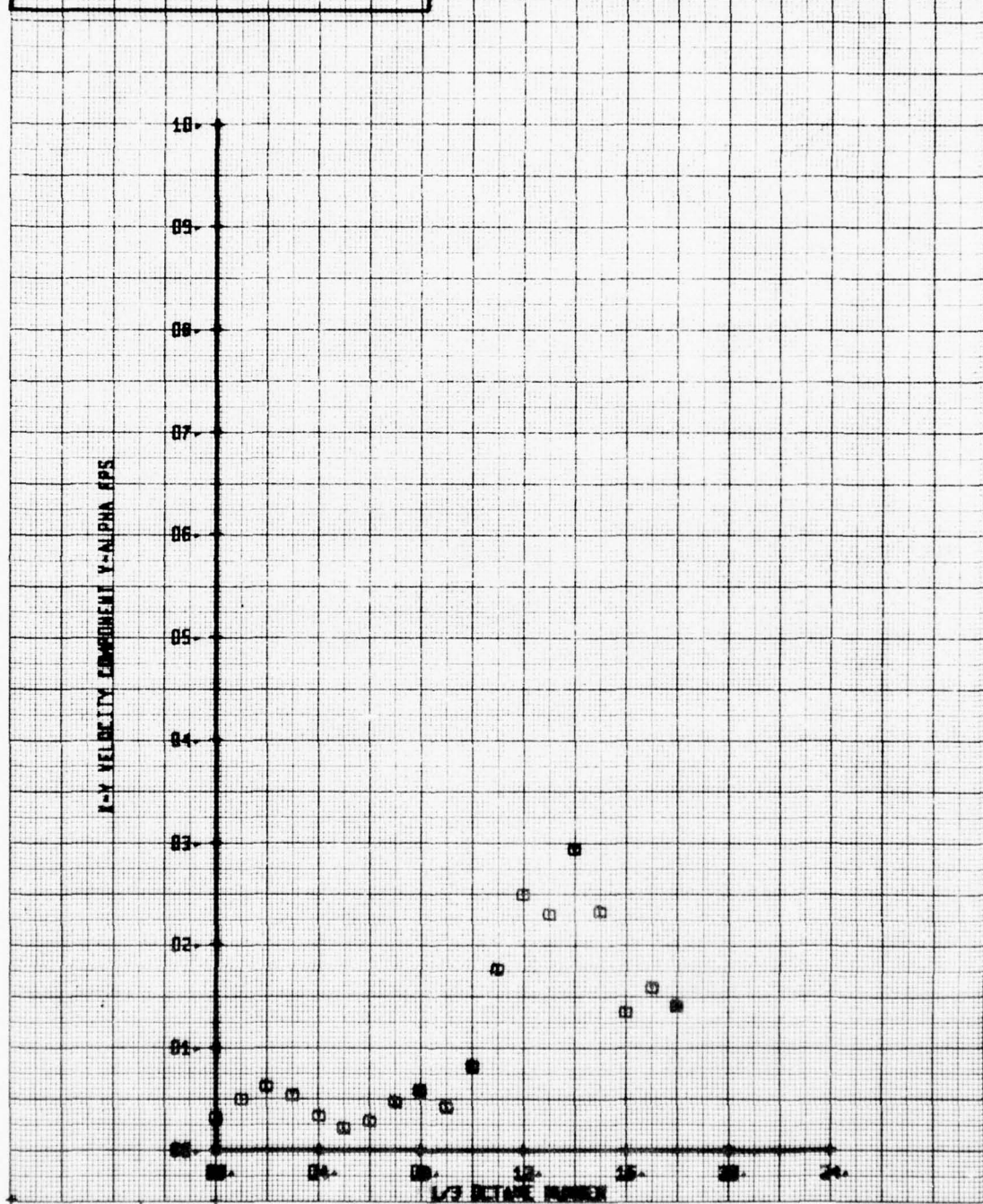
LEGEND  
SYM CH PARAMETER  
□ 66 V-ALPHA





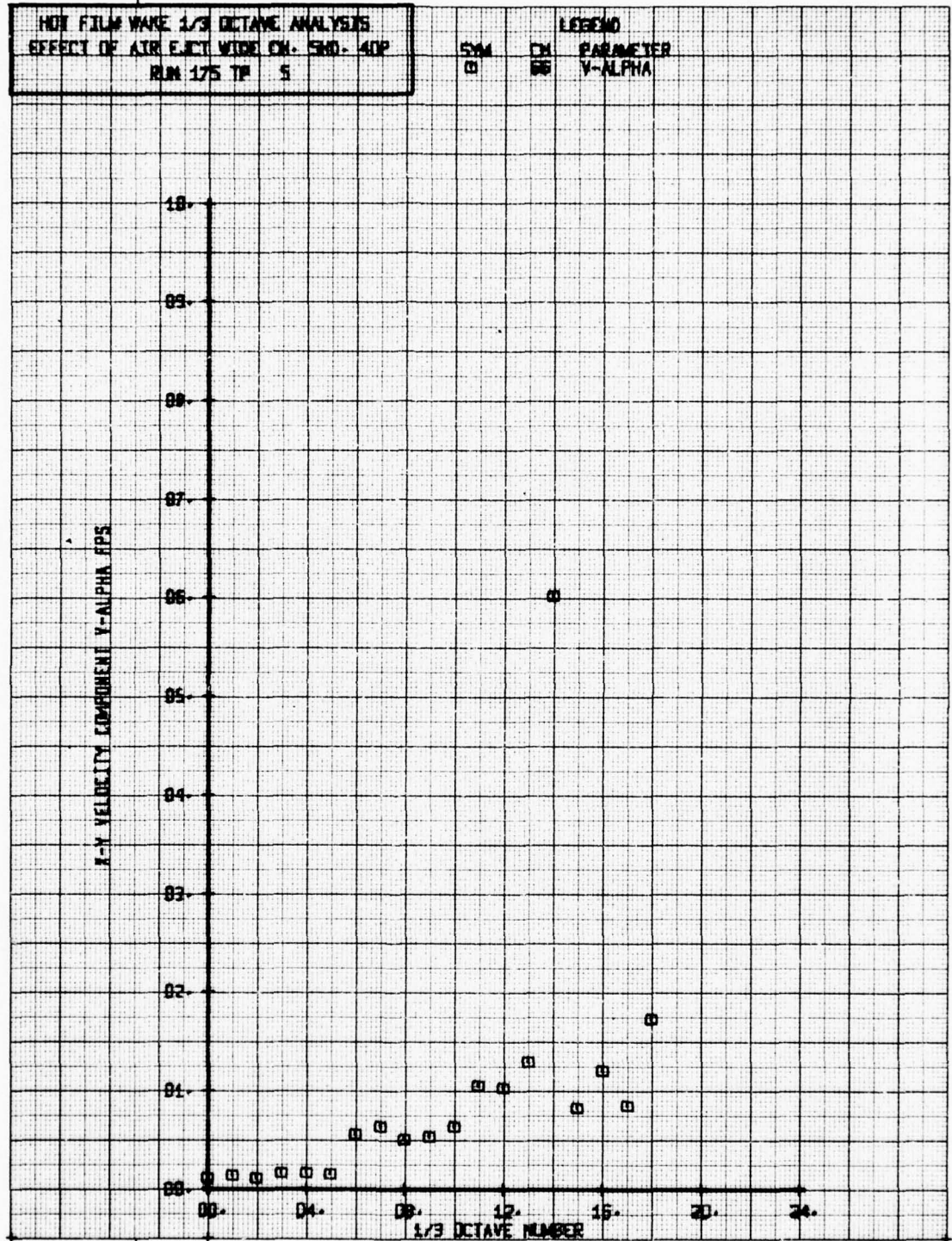
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE CH- 5HD- 4DP  
 RUN 175 TP 4

SYM CH PARAMETER  
 0 66 V-ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE ON- 540- 40P  
 RUN 175 TP 5

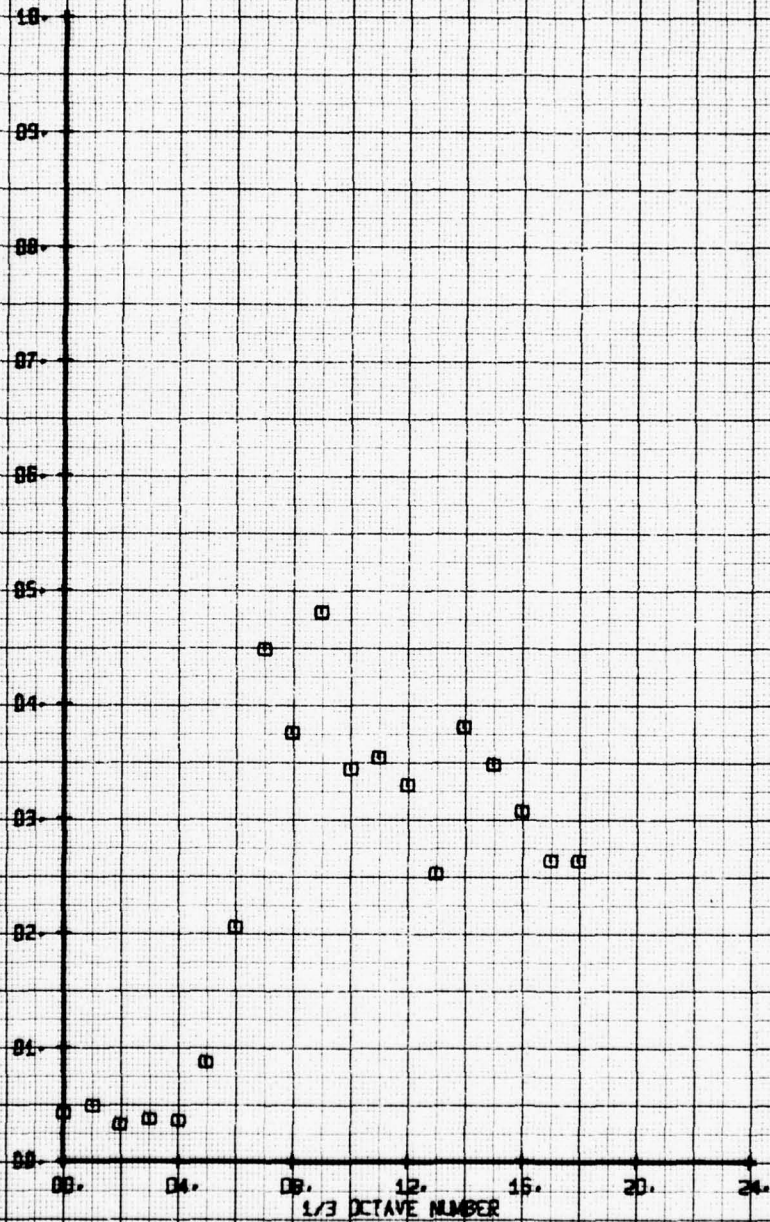
LEGEND  
 CH 06  
 PARAMETER  
 V-ALPHA



HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE CH. SHD. 40P  
 RUN 175 TP 2

LEGEND	
SYM	CH
□	65
PARAMETER	
V-BETA	

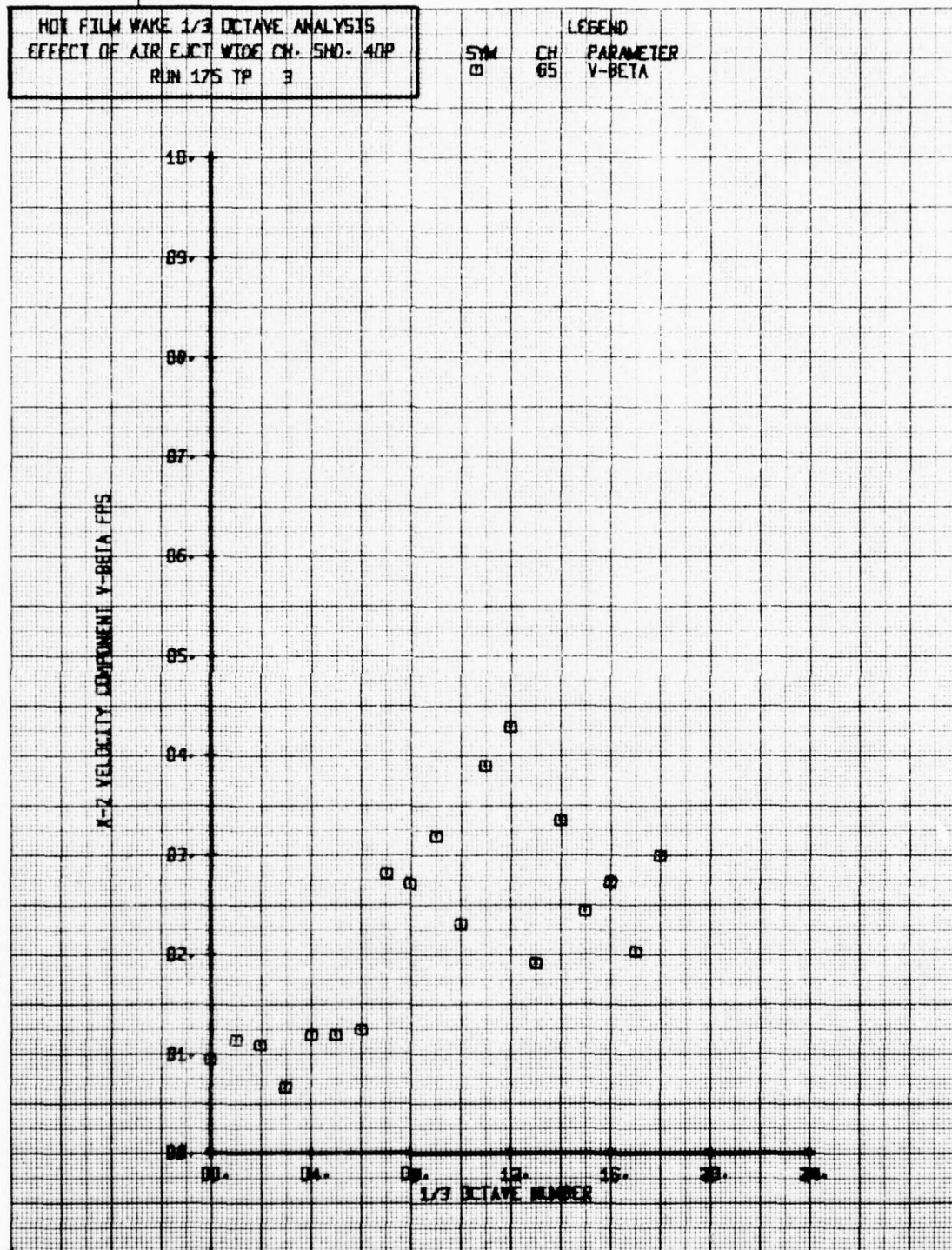
X-Z VELOCITY COMPONENT V-BETA FPS





NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE CH. SHD. 40P  
 RUN 175 TP 3

LEGEND  
 CH 65  
 PARAMETER  
 V-BETA

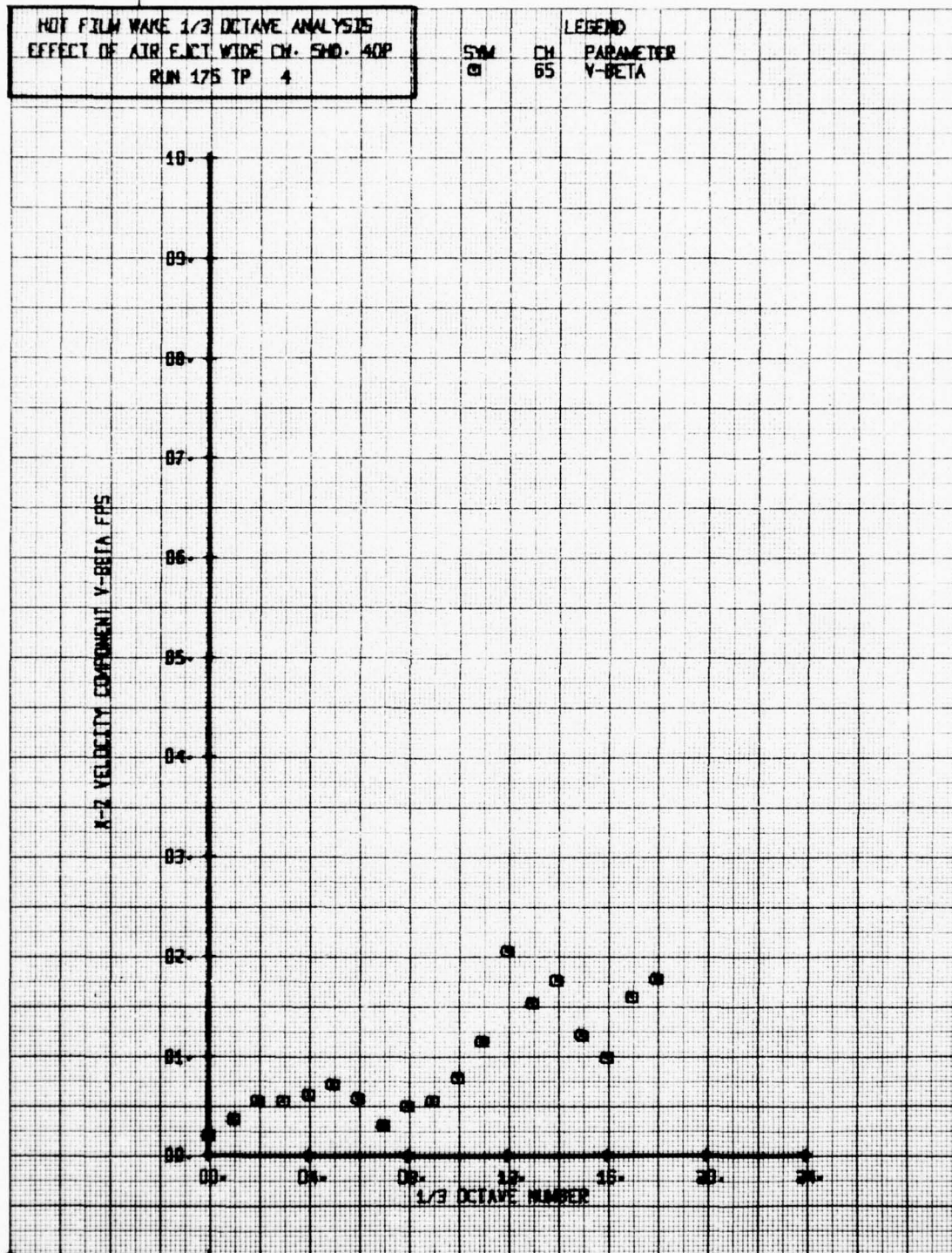




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 EFFECT OF AIR EJECT WIDE CH. SHD. 40P  
 RUN 175 TP 4

SYM	CH	PARAMETER
□	65	V-BETA

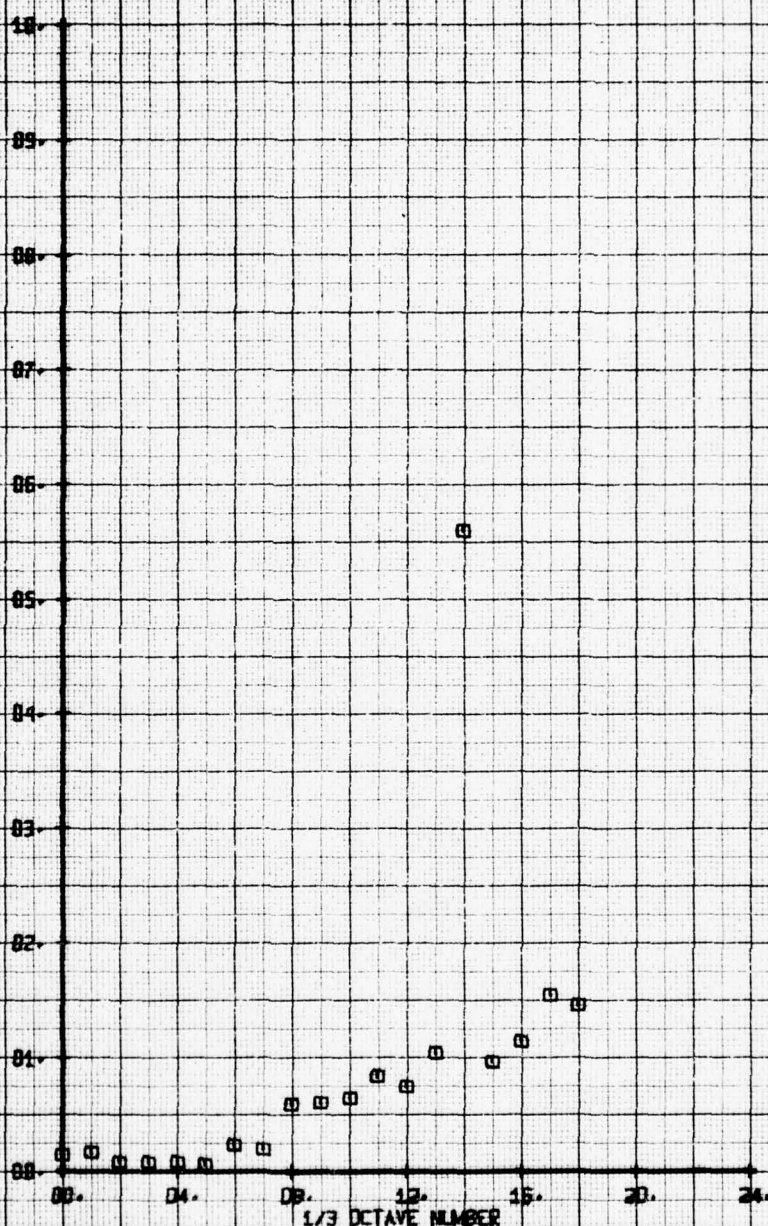
X-Z VELOCITY COMPONENT V-BETA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
EFFECT OF AIR JET WIDE CH. 540-40P  
RIN 175 TF S

SYM CH  
0 05  
LEGEND  
PARAMETER  
Y-BETA

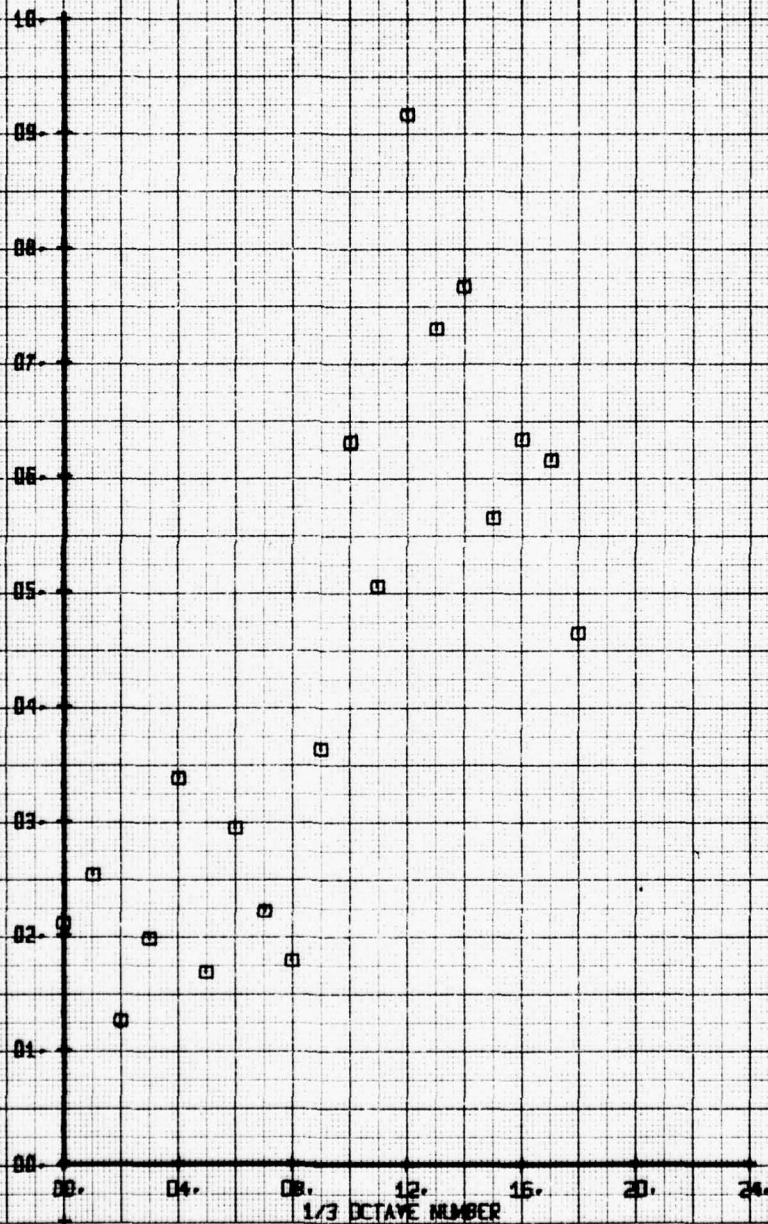
X-Z VELOCITY COMPONENT Y-BETA FHS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-150 PSI  
 RUN 176 TP 1

LEGEND  
 CH 66  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



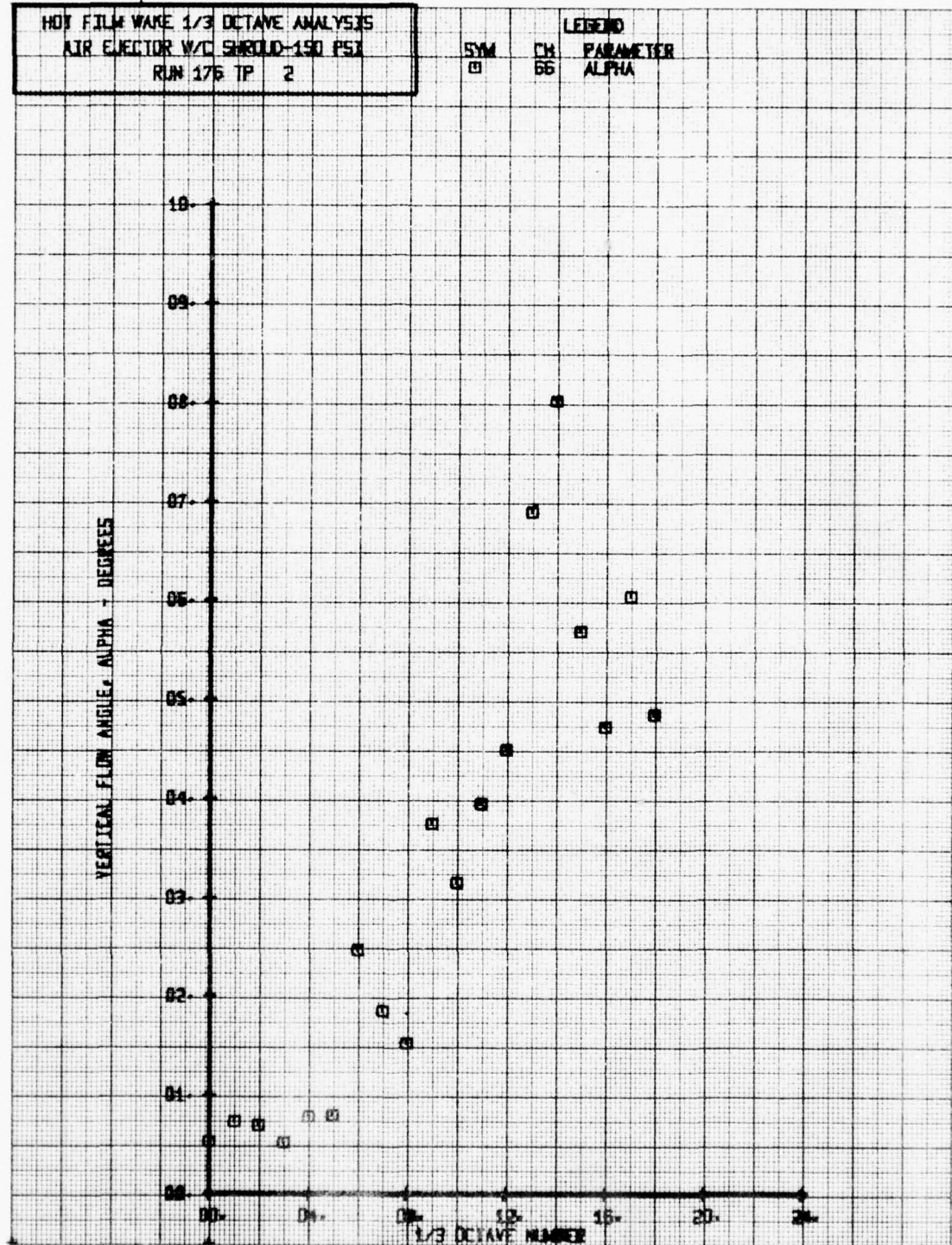


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 2

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 ALPHA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 3

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES

10  
 09  
 08  
 07  
 06  
 05  
 04  
 03  
 02  
 01  
 00

1/3 OCTAVE NUMBER

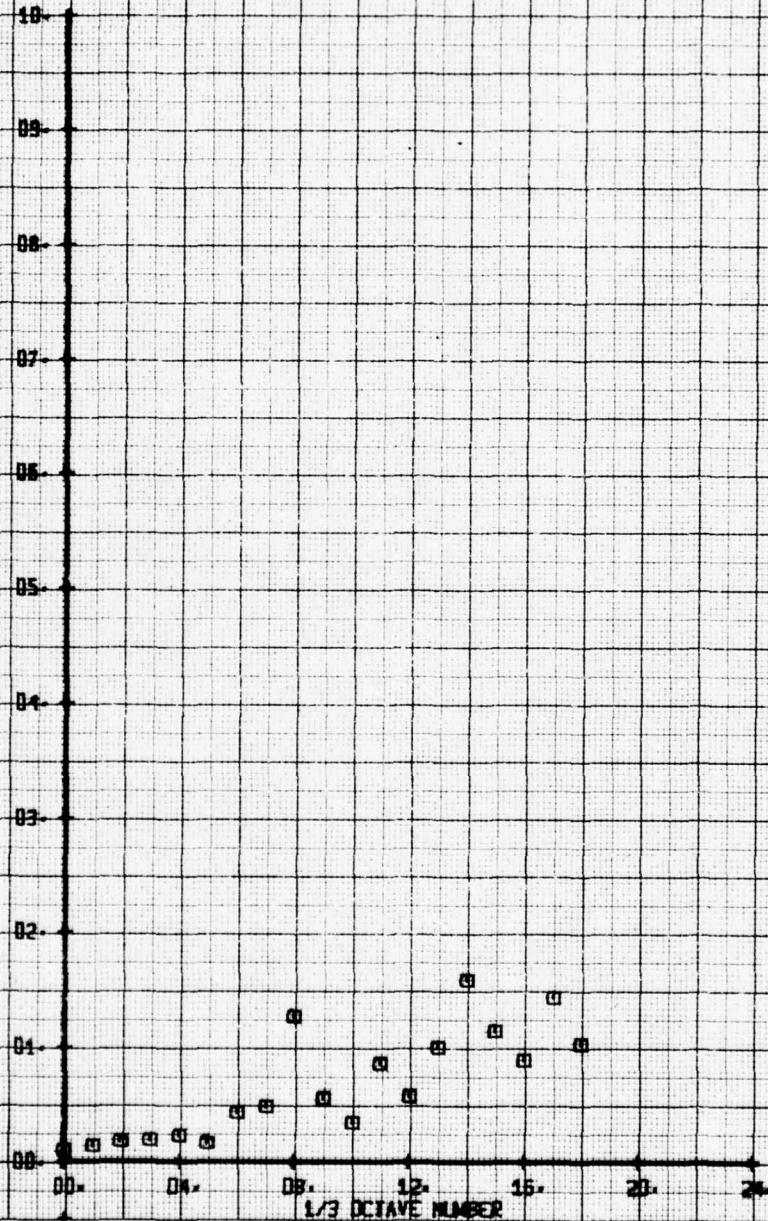
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 4

SYM  
 □

CH  
 66

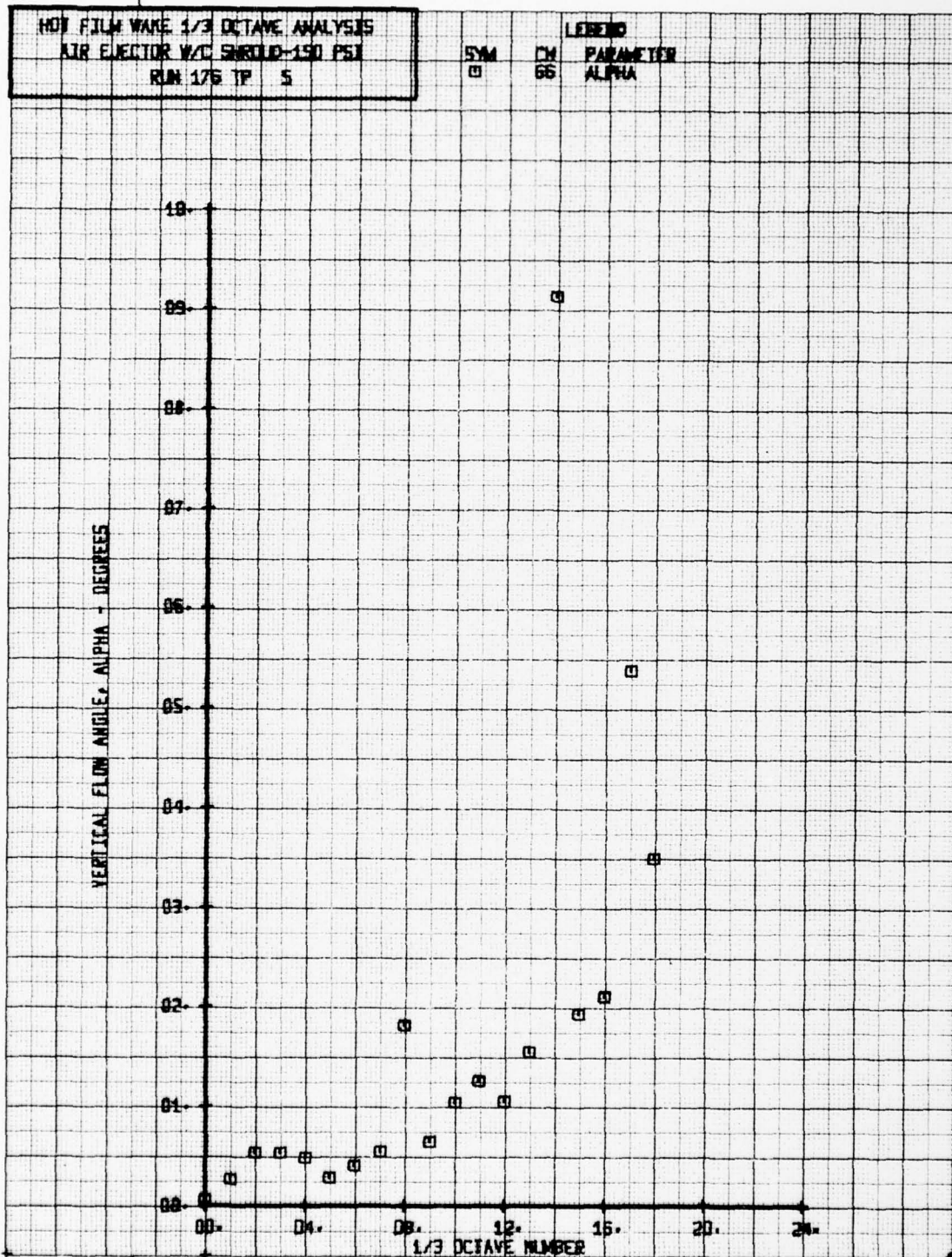
LEGEND  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 5

SYN CH  
 0 66  
 PARAMETER  
 ALPHA



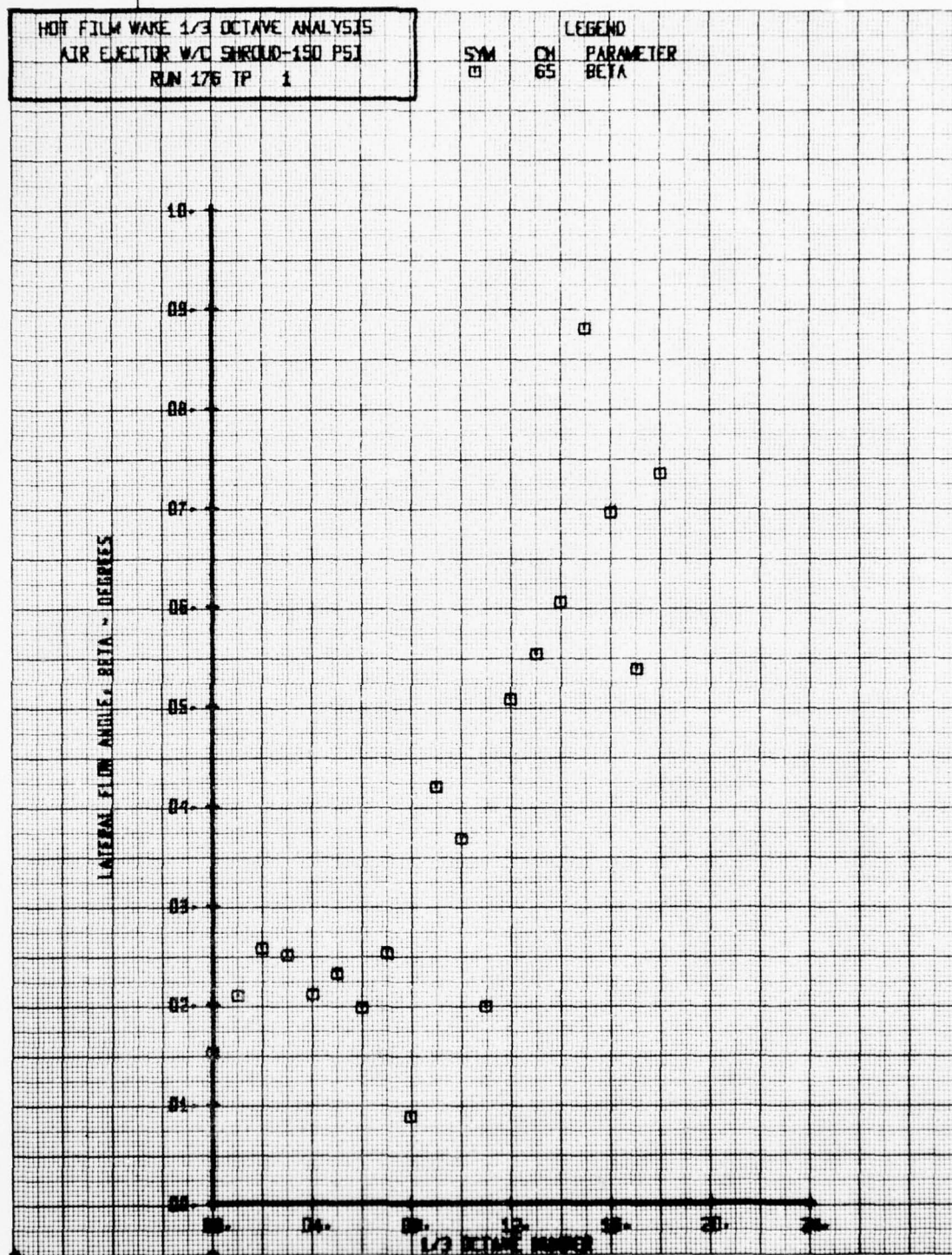


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-150 PSI  
 RUN 176 TP 1

SYM  
 □

CH  
 65

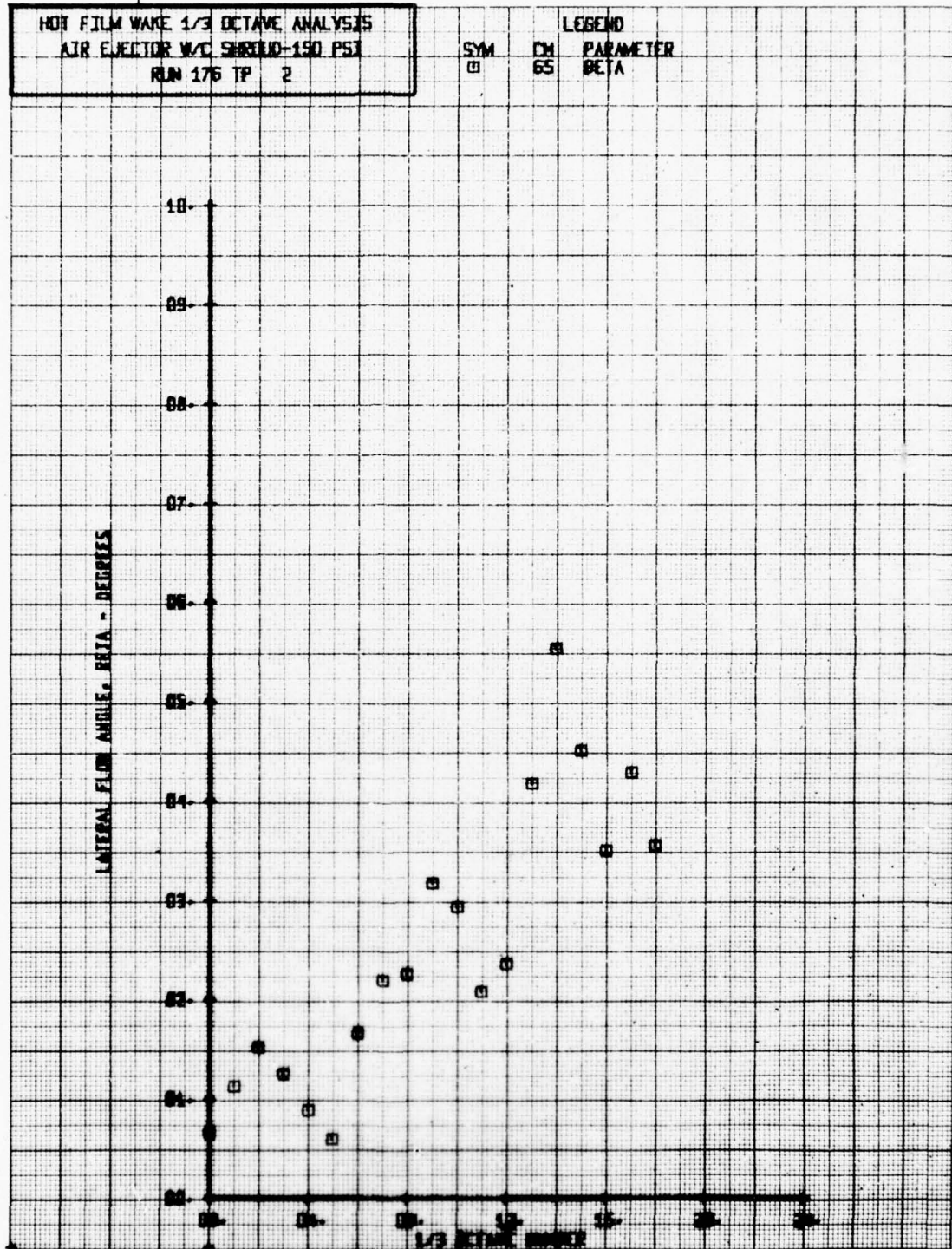
LEGEND  
 PARAMETER  
 BETA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 2

SYM	CH	PARAMETER
□	65	BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS

AIR EJECTOR W/O SHROUD-150 PSI

RUN 176 TP 3

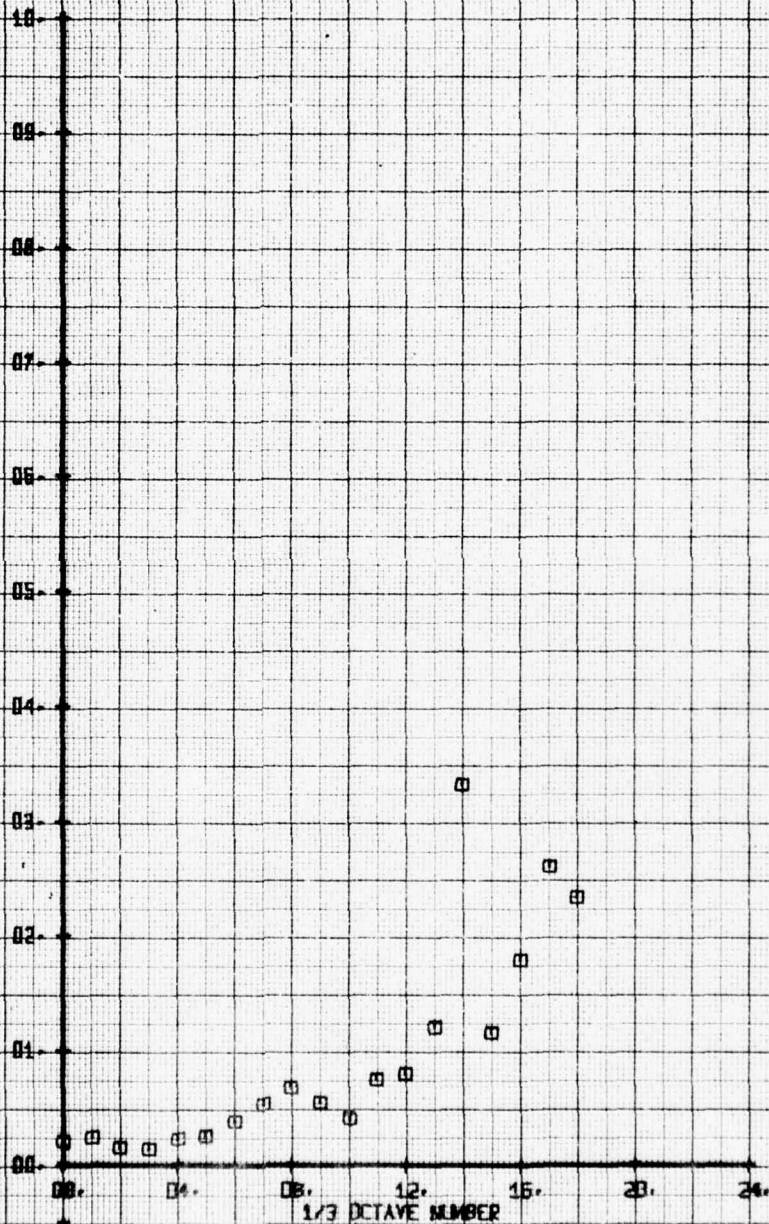
SYM  
□

CH  
65

LEGEND

PARAMETER  
BETA

LATERAL FLOW ANGLE, BETA - DEGREES



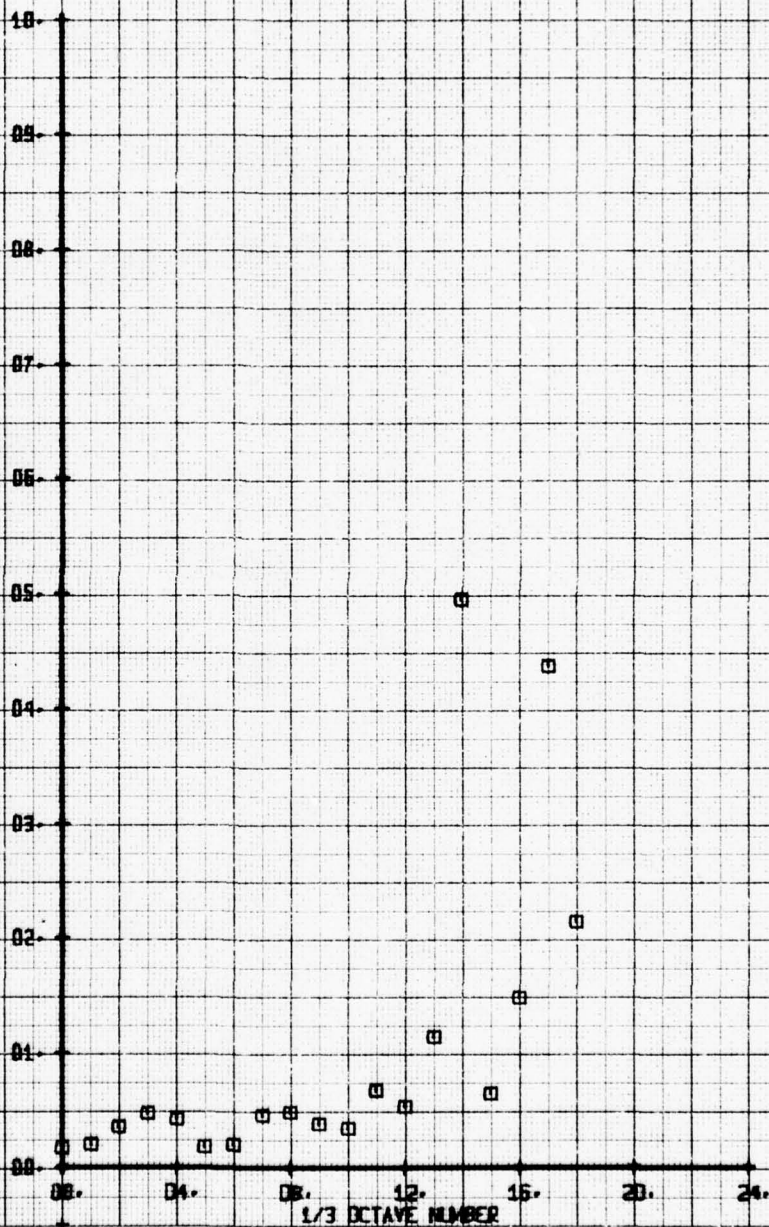
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 4

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES





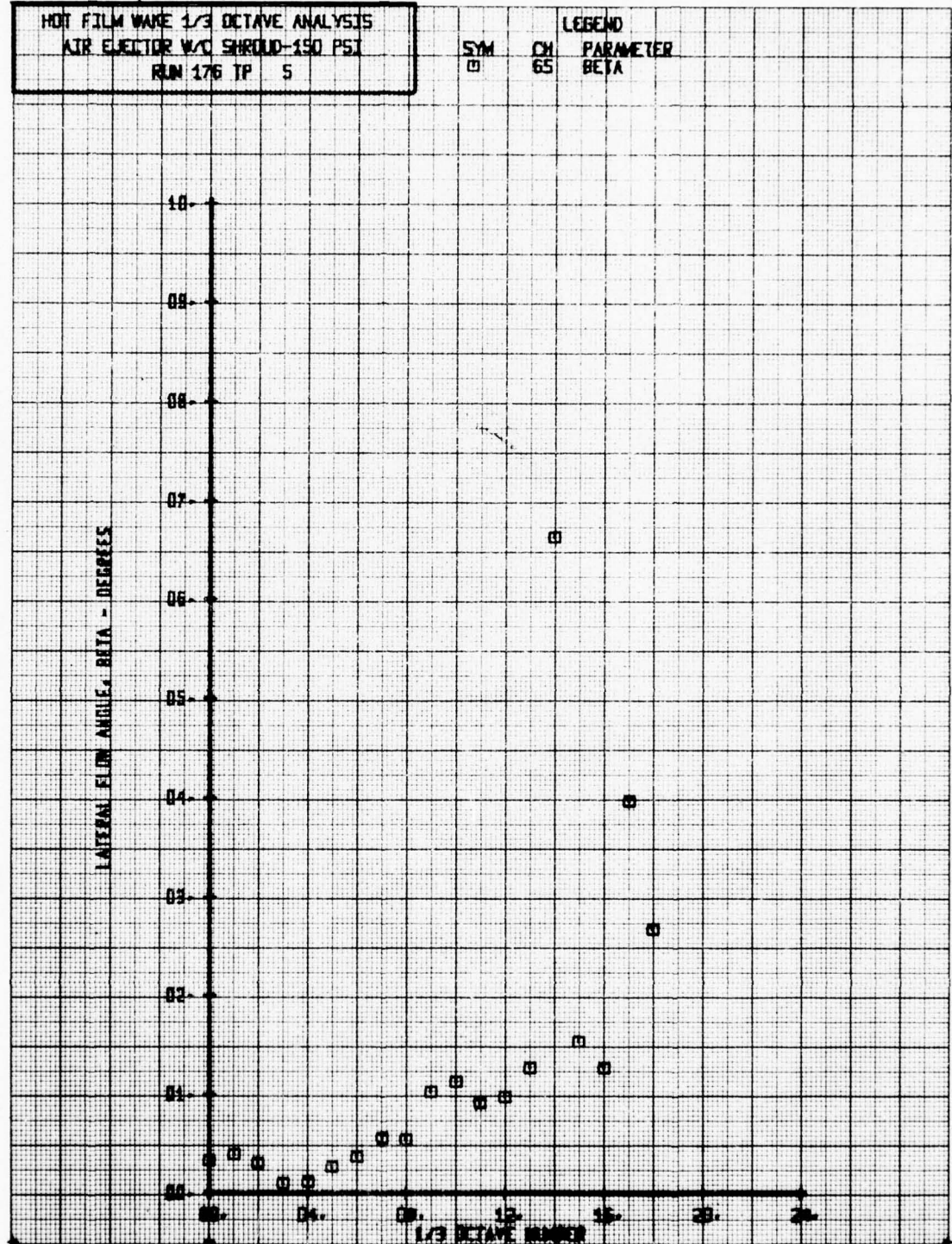
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-150 PSI  
 RUN 176 TP 5

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES





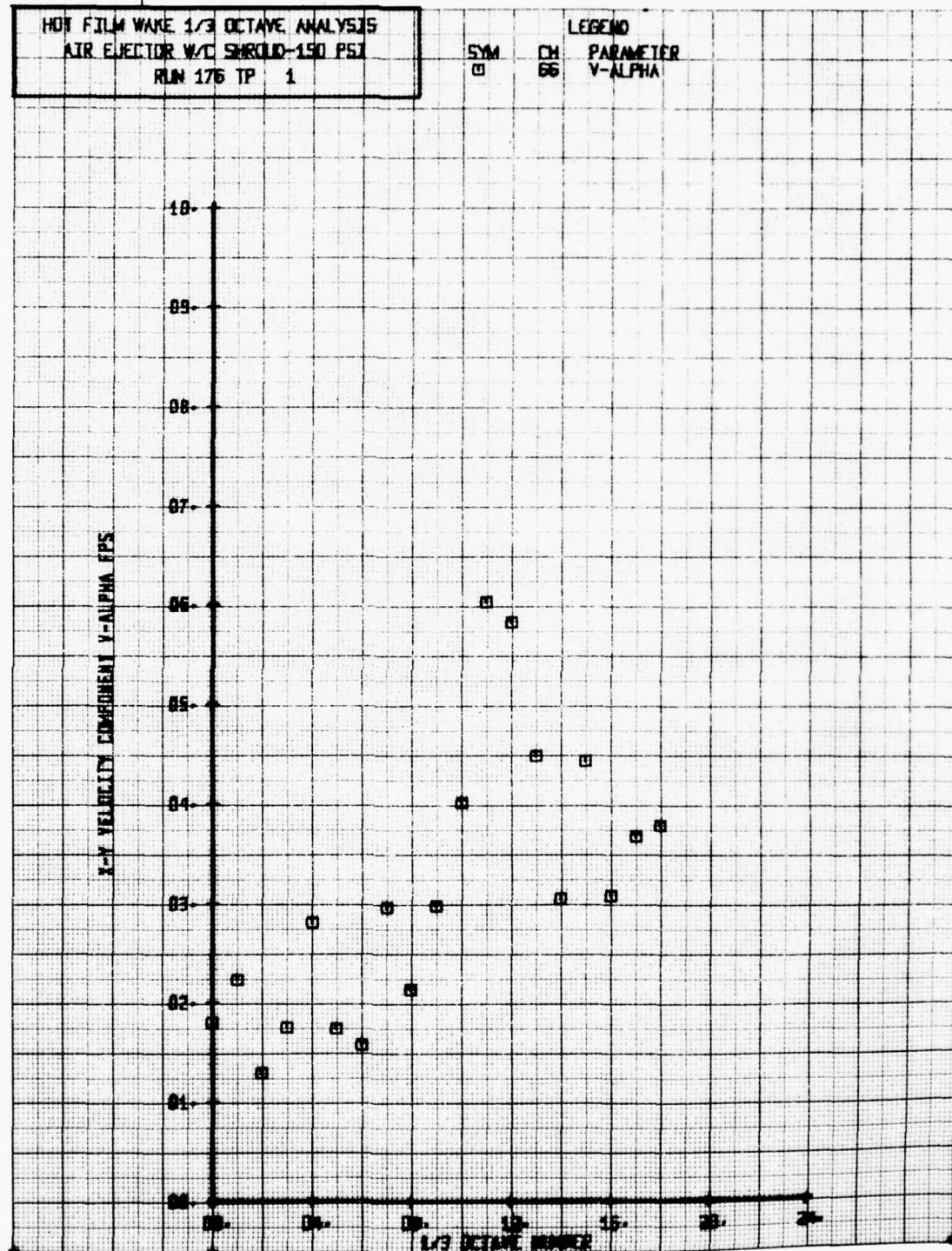
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 1

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



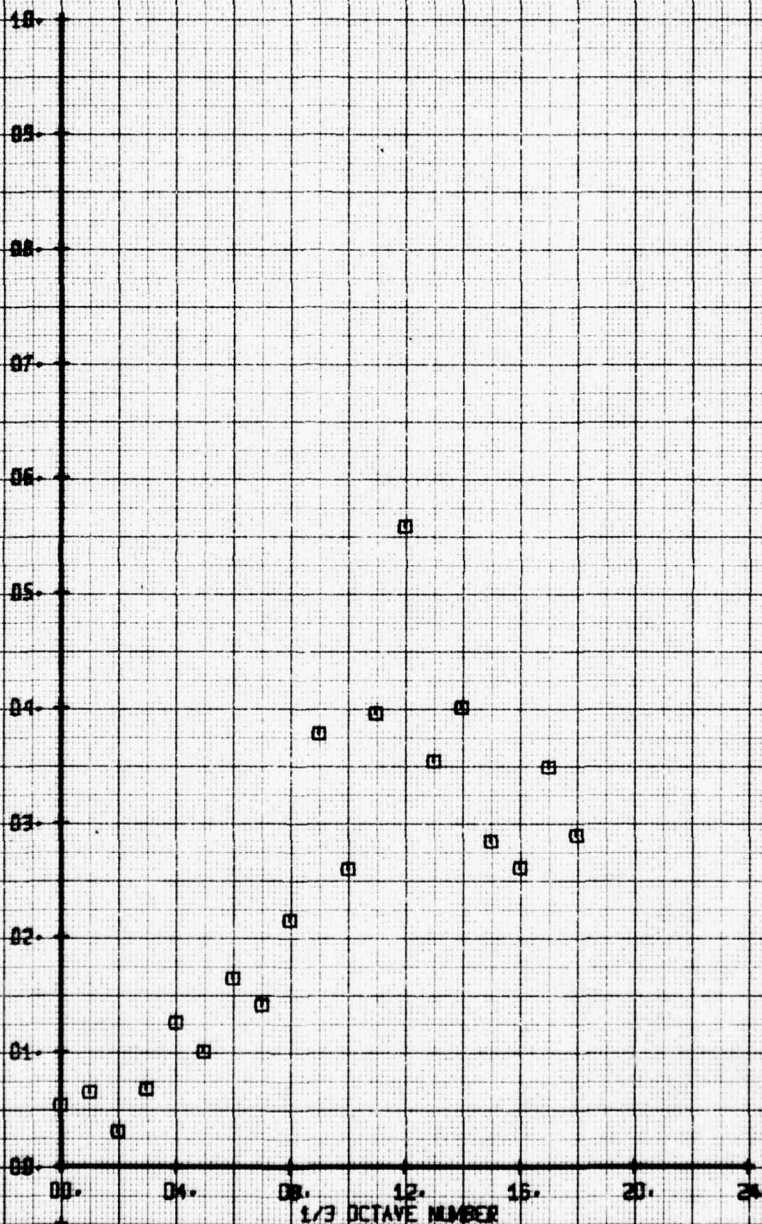
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-150 PSJ  
 RUN 176 TP 2

SM  
 0

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

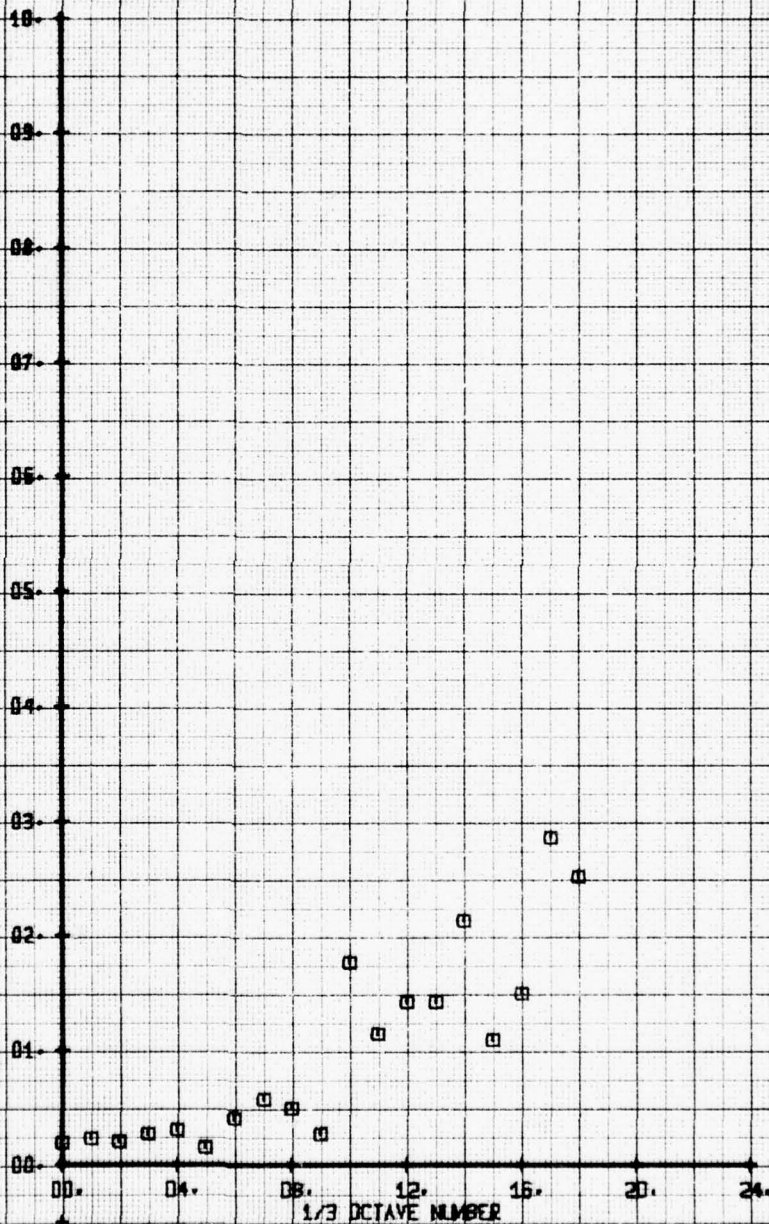
X-Y VELOCITY COMPONENT V-ALPHA FPS



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 175 TP 3

LEGEND	
SYM	CH
□	66
PARAMETER	
V-ALPHA	

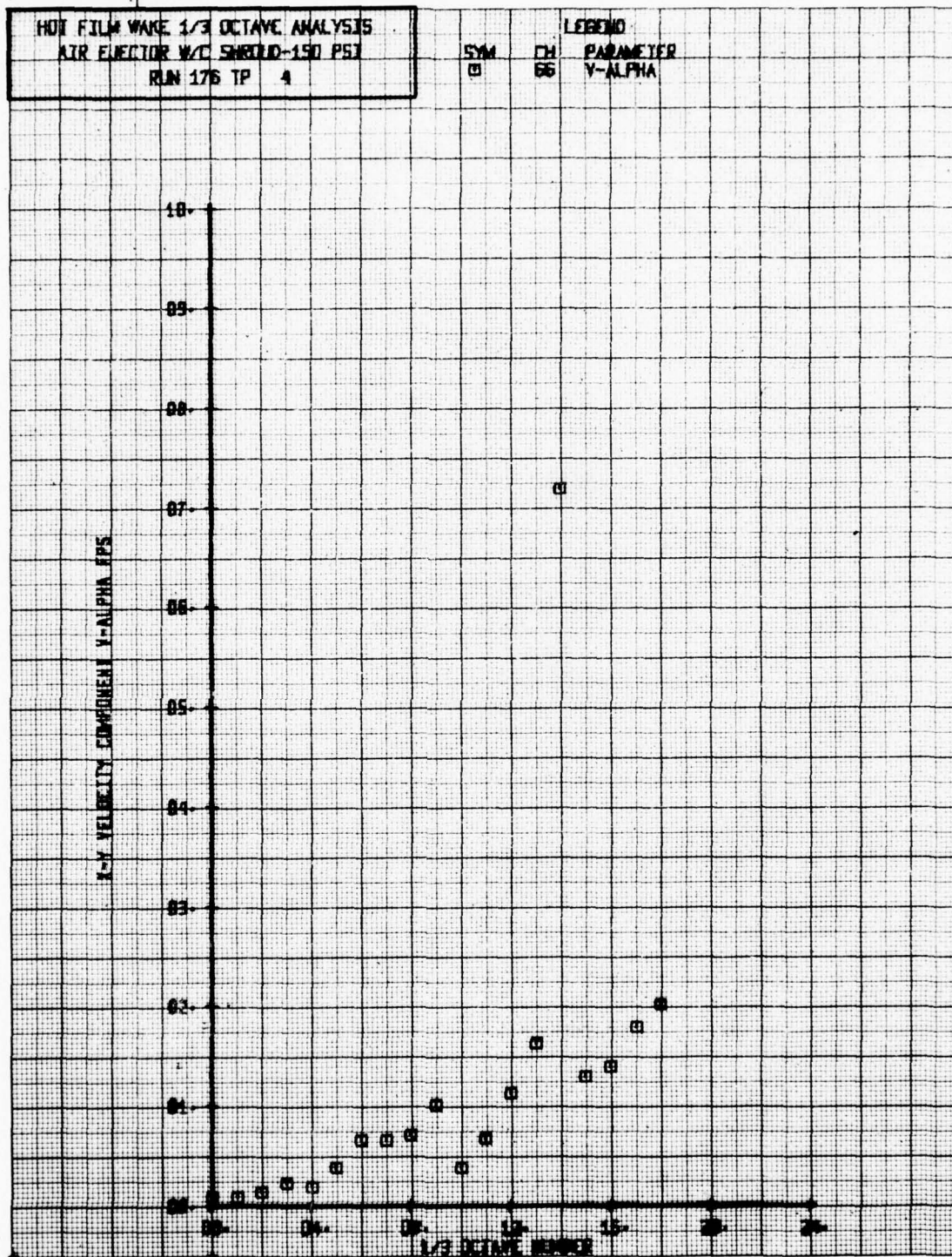
X-Y VELOCITY COMPONENT V-ALPHA FPS





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 4

SYM	CH	LEGEND	PARAMETER
□	66		V-ALPHA





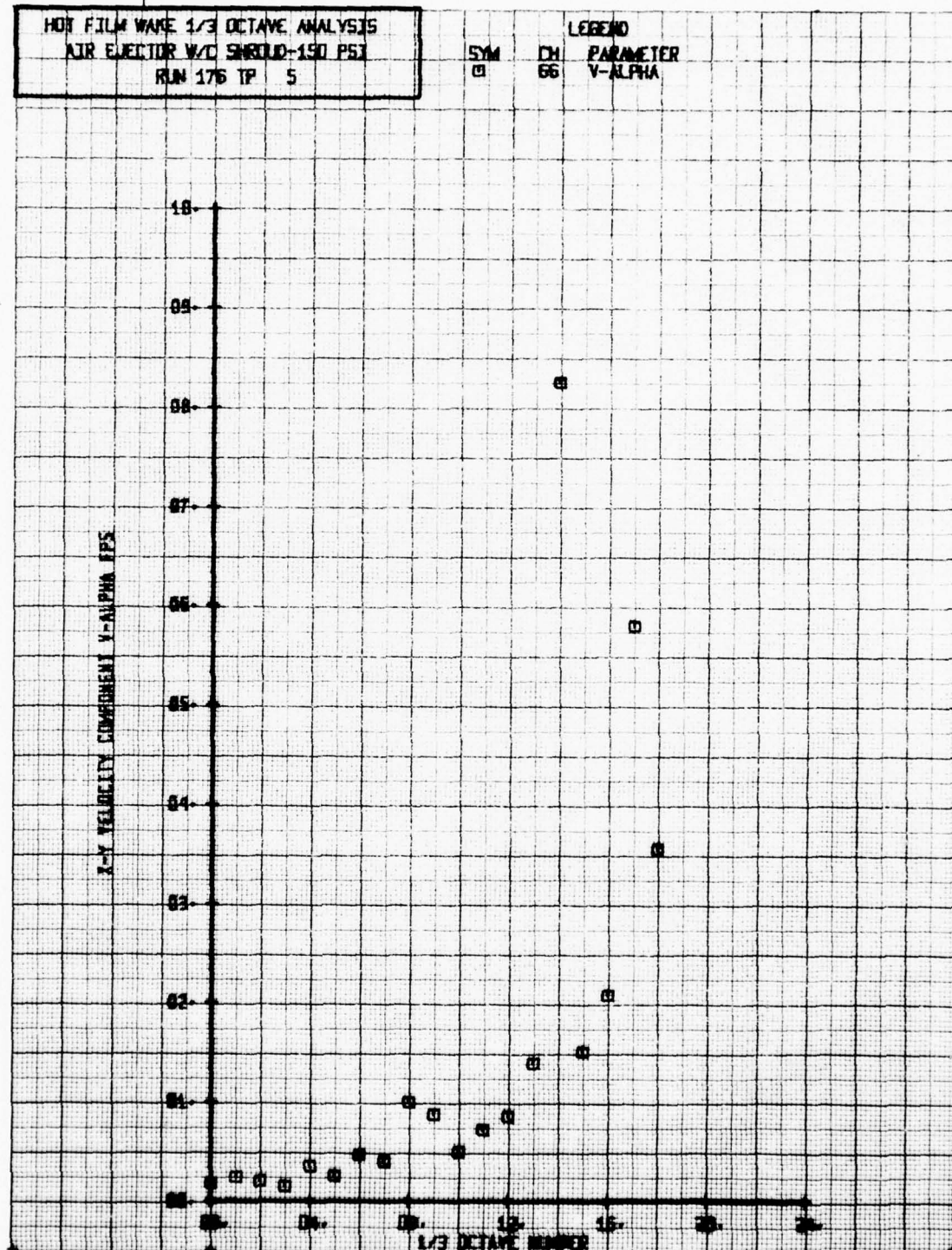
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-190 P53  
 RUN 176 TP 5

SYM  
 □

CH  
 66

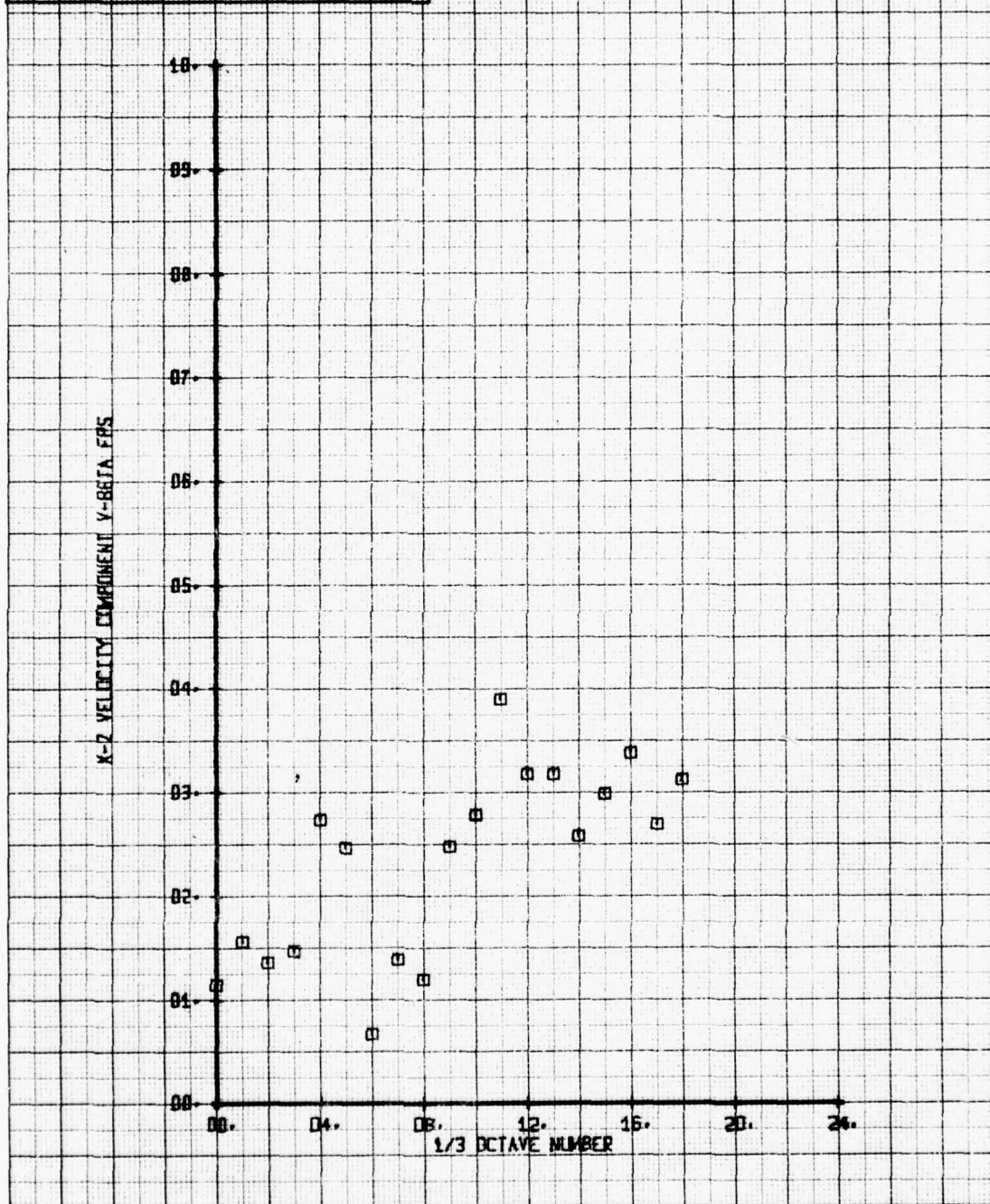
LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA IPS



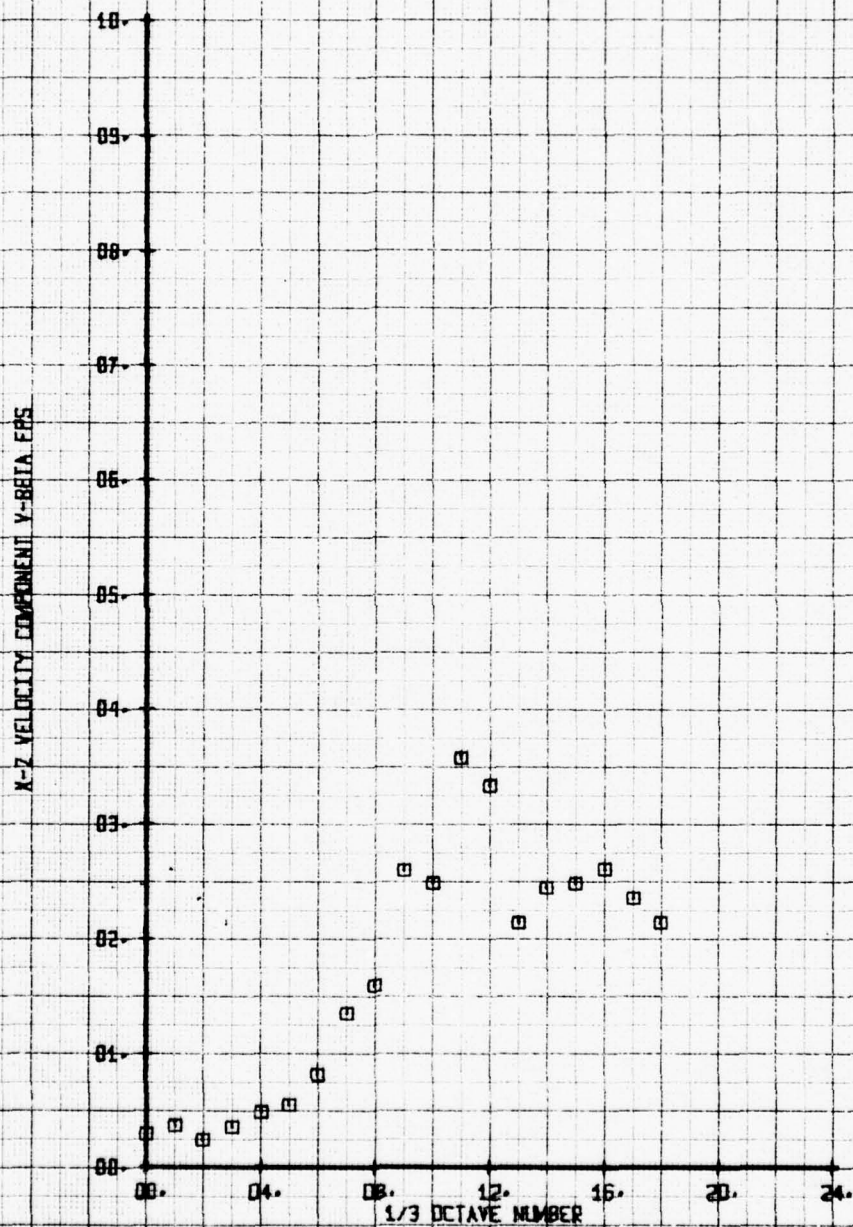
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-150 PSI  
 RUN 176 TP 1

SYM	CH	LEGEND
□	65	PARAMETER V-BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 2

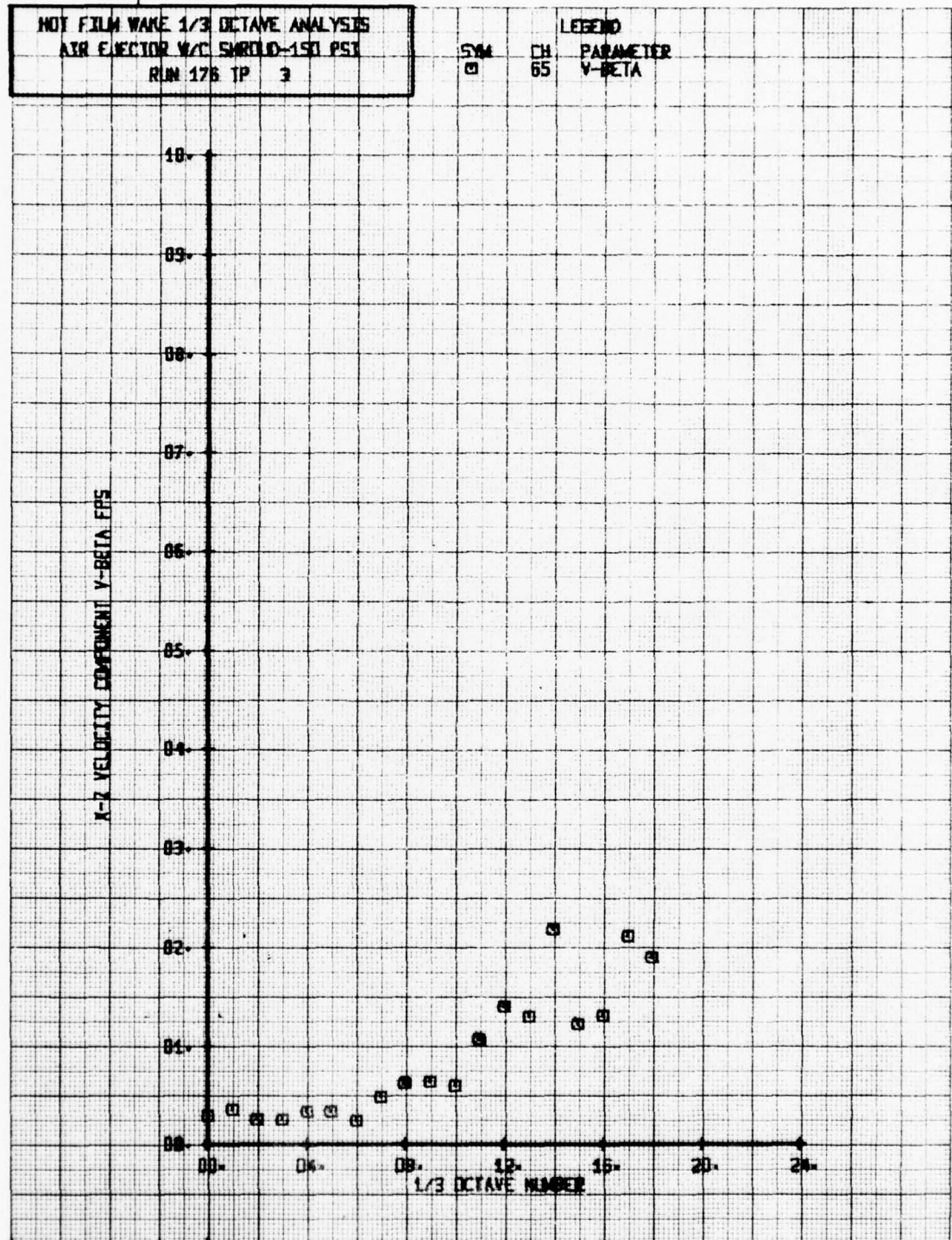
SYM CH PARAMETER  
 □ 65 V-BETA





NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 3

SYN CH PARAMETER  
 0 65 V-BETA





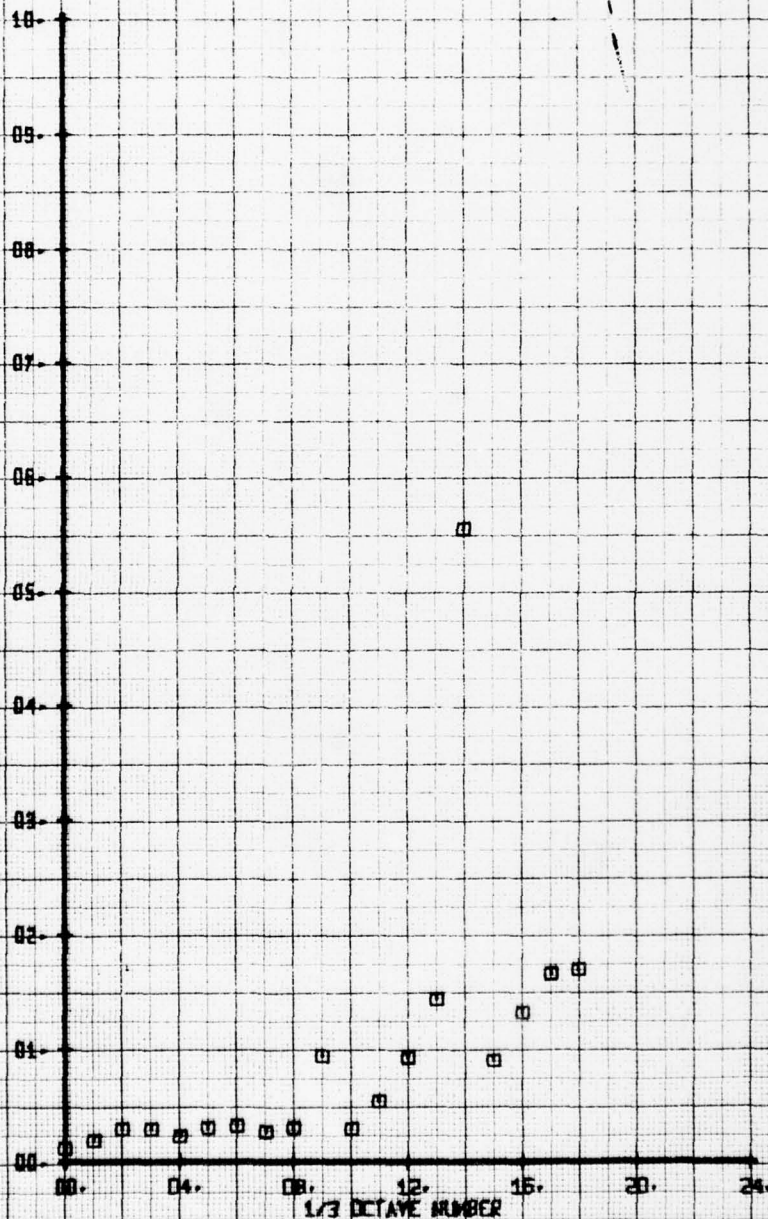
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/C SHROUD-150 PSI  
 RUN 176 TP 4

SYM  
 □

CH  
 65

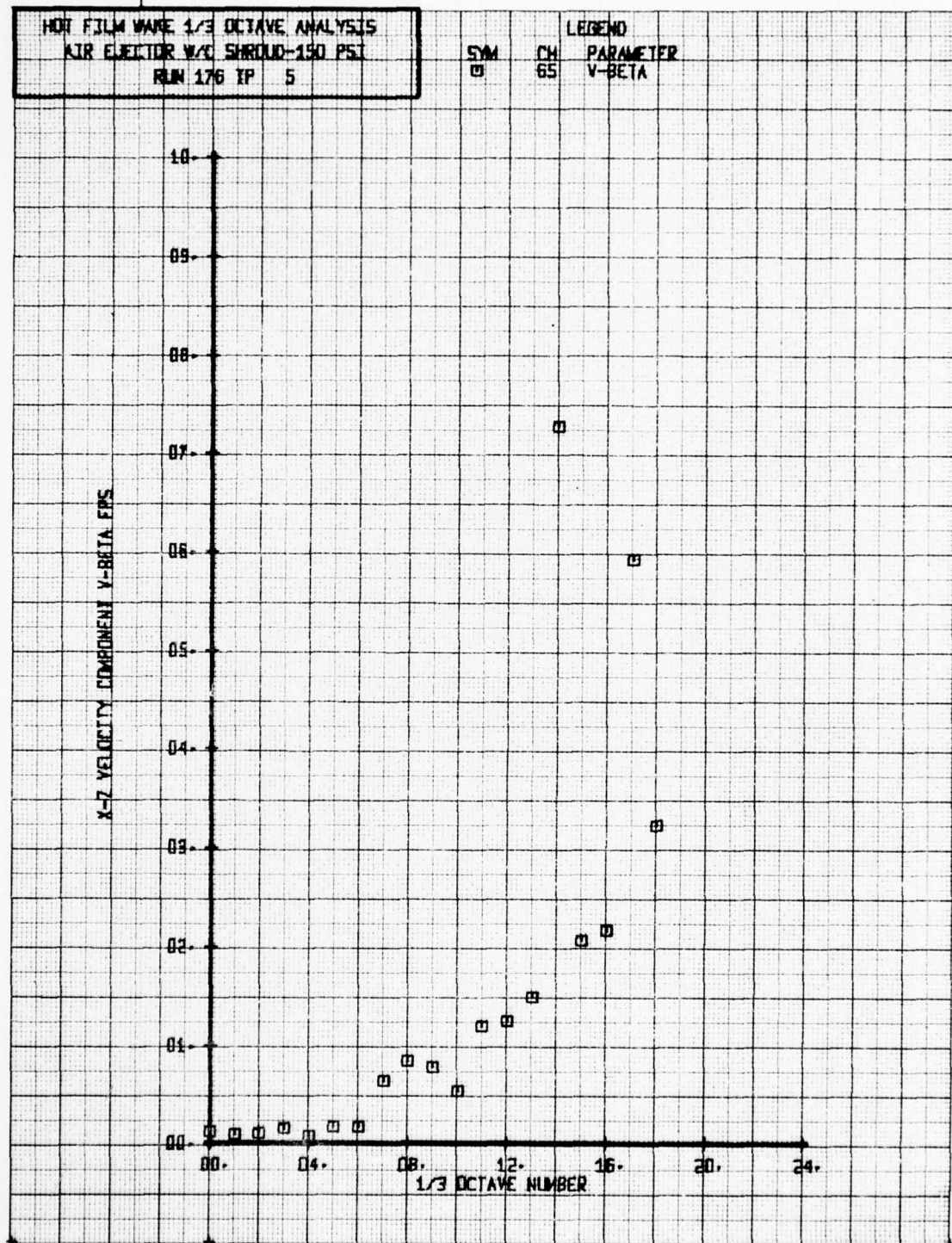
LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



HOT FILM WARE 1/3 OCTAVE ANALYSIS  
 AIR EJECTOR W/O SHROUD-150 PSI  
 RUN 176 IP 5

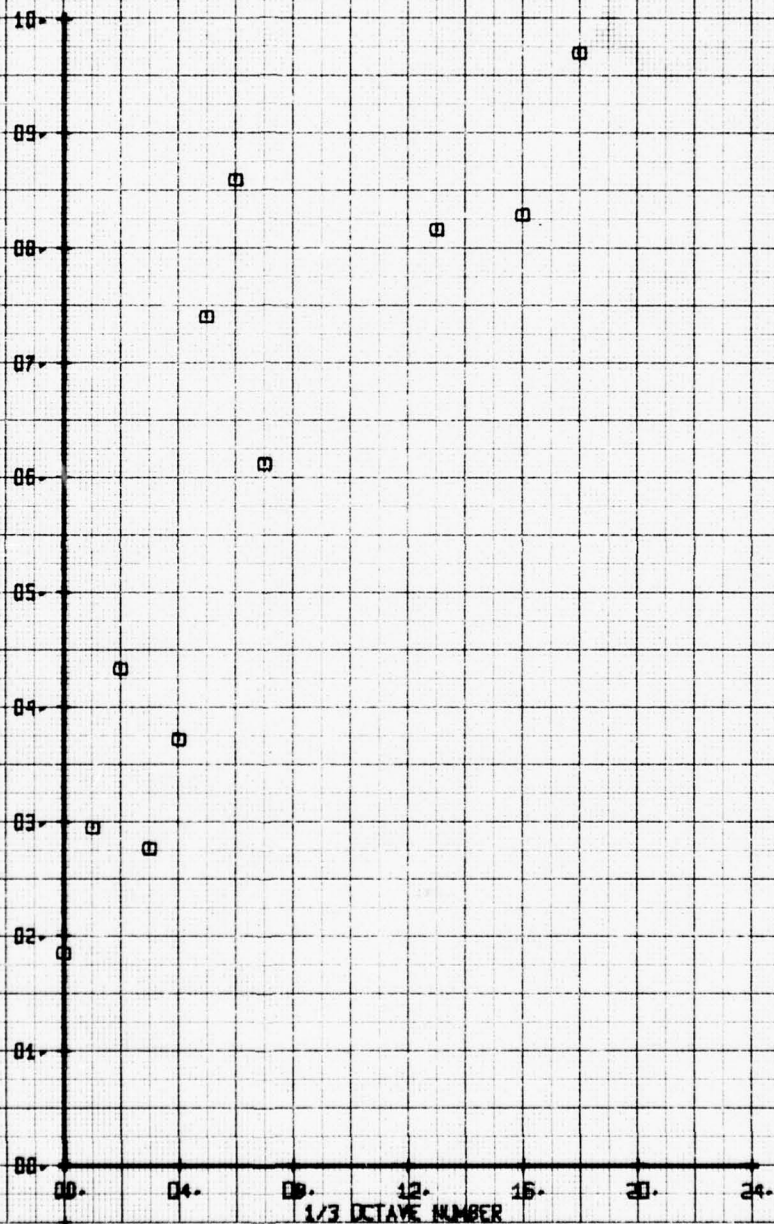
SYM	CH	PARAMETER
□	65	V-BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W/C S.W.R.D. V. 1 IP 40PSI  
 RUN 184 TP 2

SYM	CH	LEGEND
□	66	PARAMETER ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES

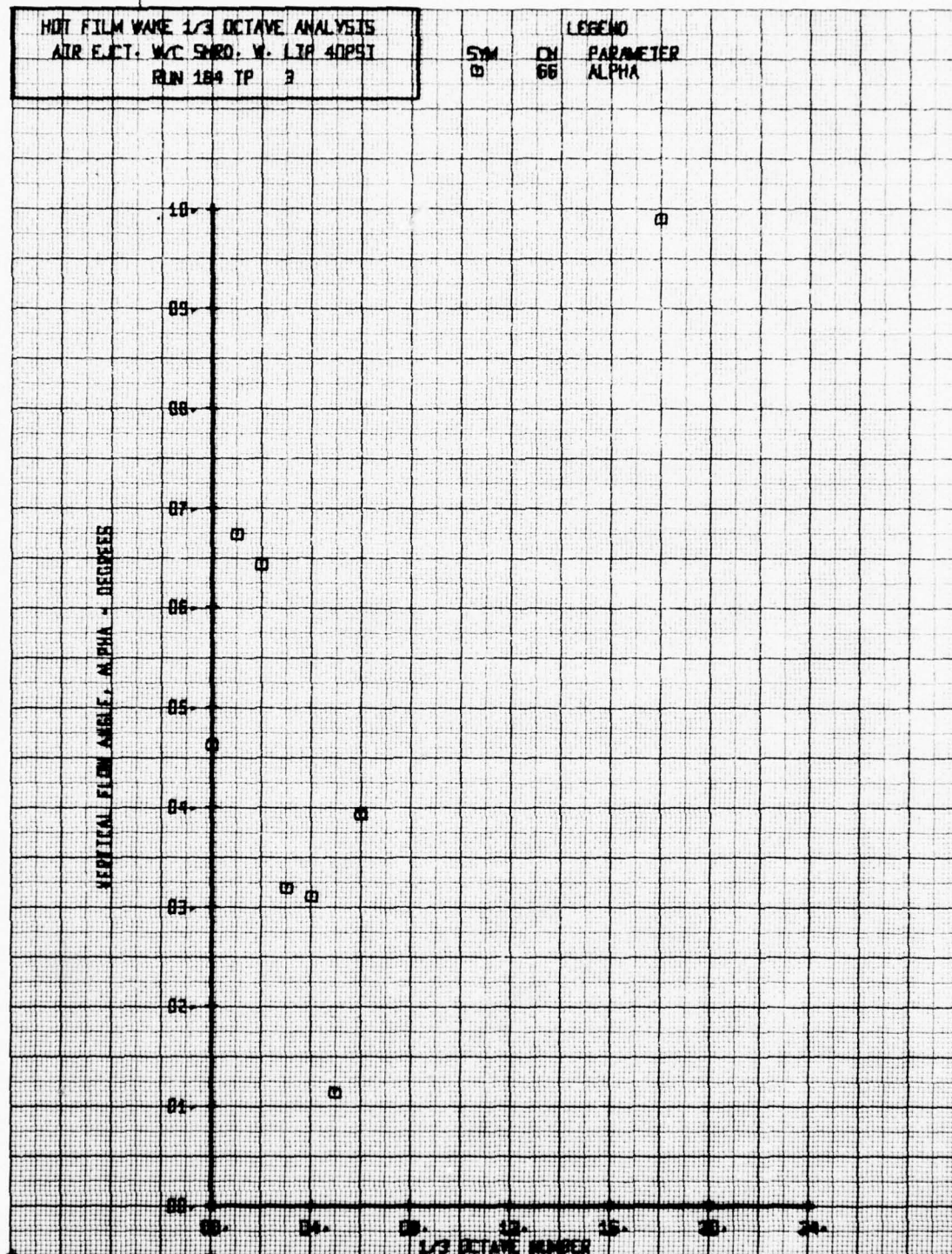


1/3 OCTAVE NUMBER



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W.C. SMD. W. LIP 40PSI  
 RUN 184 TP 3

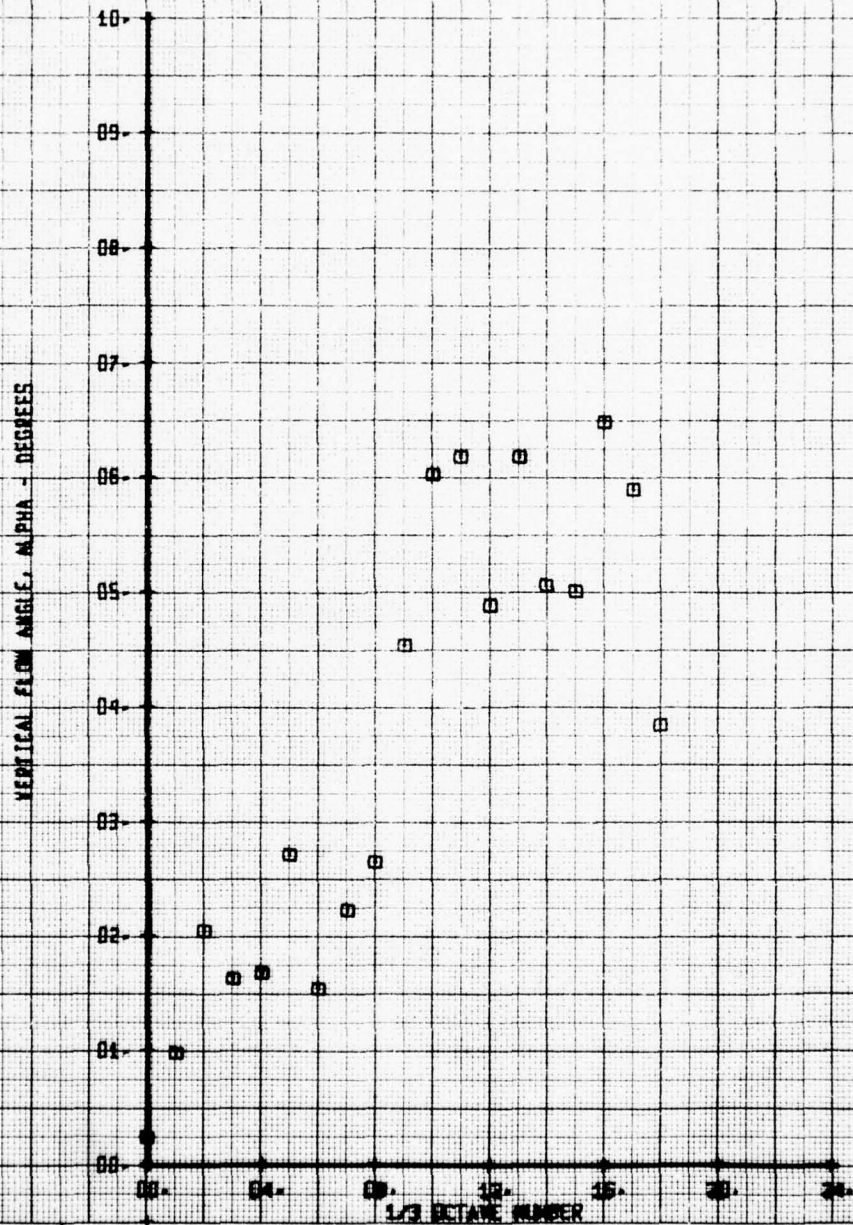
LEGEND	
SYM	PARAMETER
□	ALPHA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. V- LTP 40PSI  
 RUN 184 TP 4

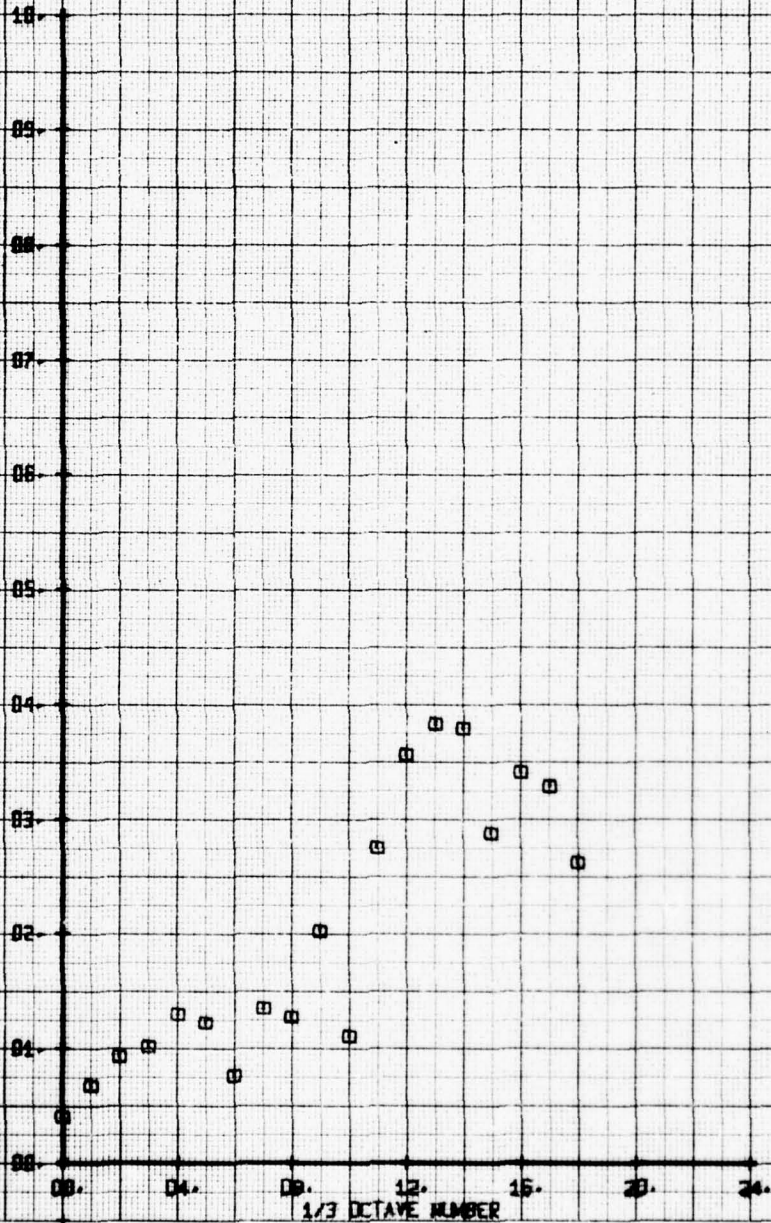
SYN CH PARAMETER  
 0 66 ALPHA



HOT FILM WARE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W.C. SHED. V. 11P 40PSI  
 RUN 104 TP 5

SYM	CH	LEGEND	PARAMETER
0	06		ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



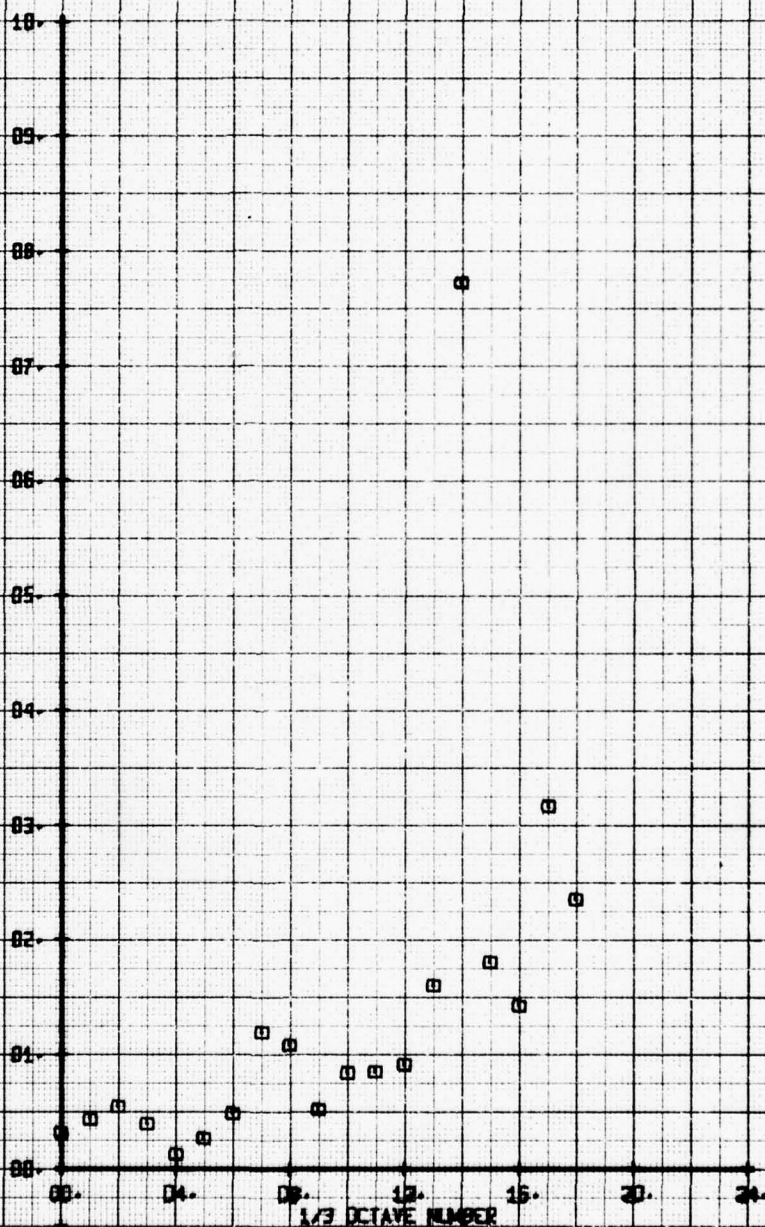
HON FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR ECT. W.C. SHED. V. 1.17 40P51  
 REM 104 TP 6

SM  
 0

CH  
 06

LEGEND  
 PARAMETER  
 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES

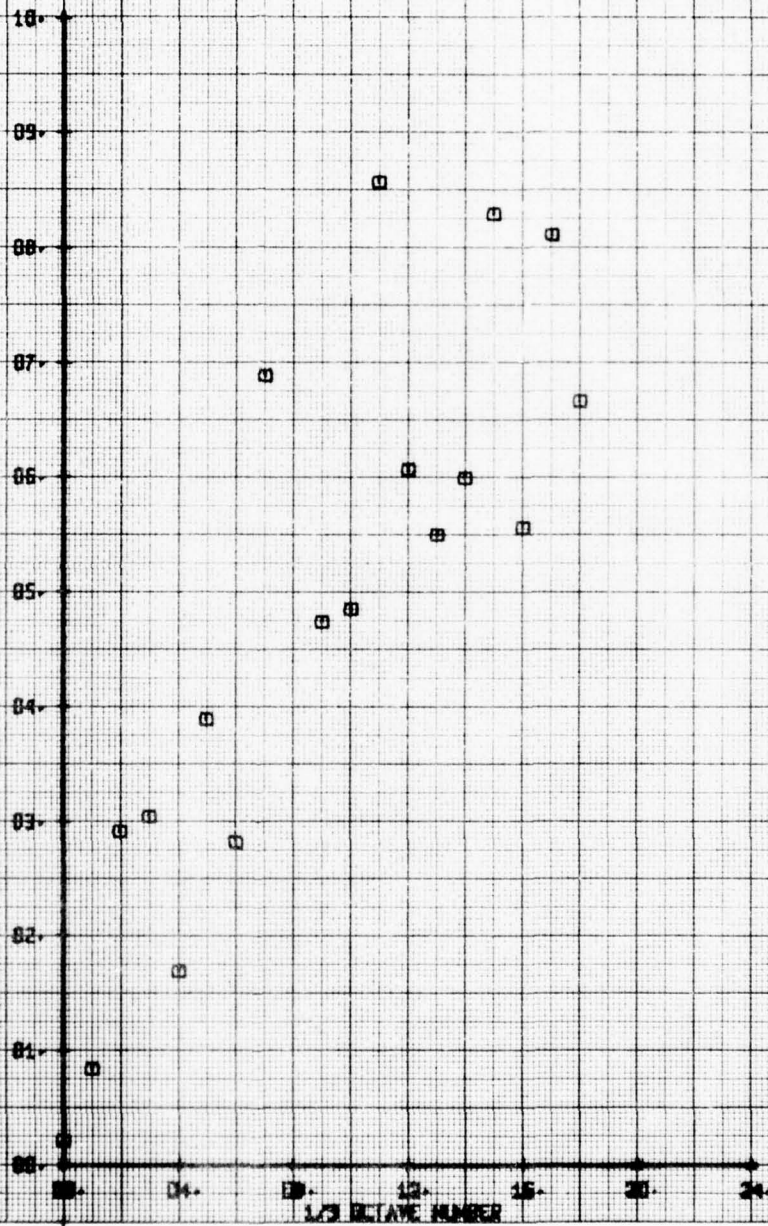




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C 5400. W. 1 IP 40PSI  
 RUN 184 TP 2

SYM CH LEGEND  
 0 65 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES

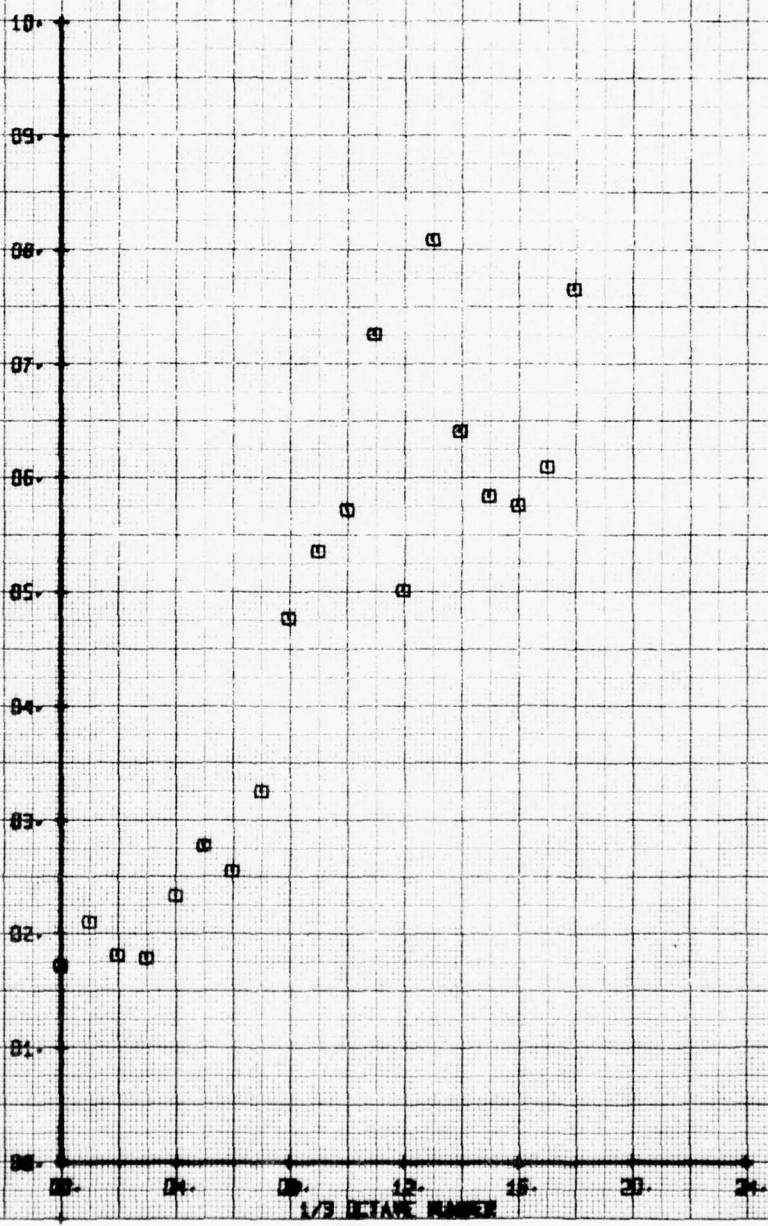




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRD. W. LIP 40PSI  
 RUN 184 TP 3

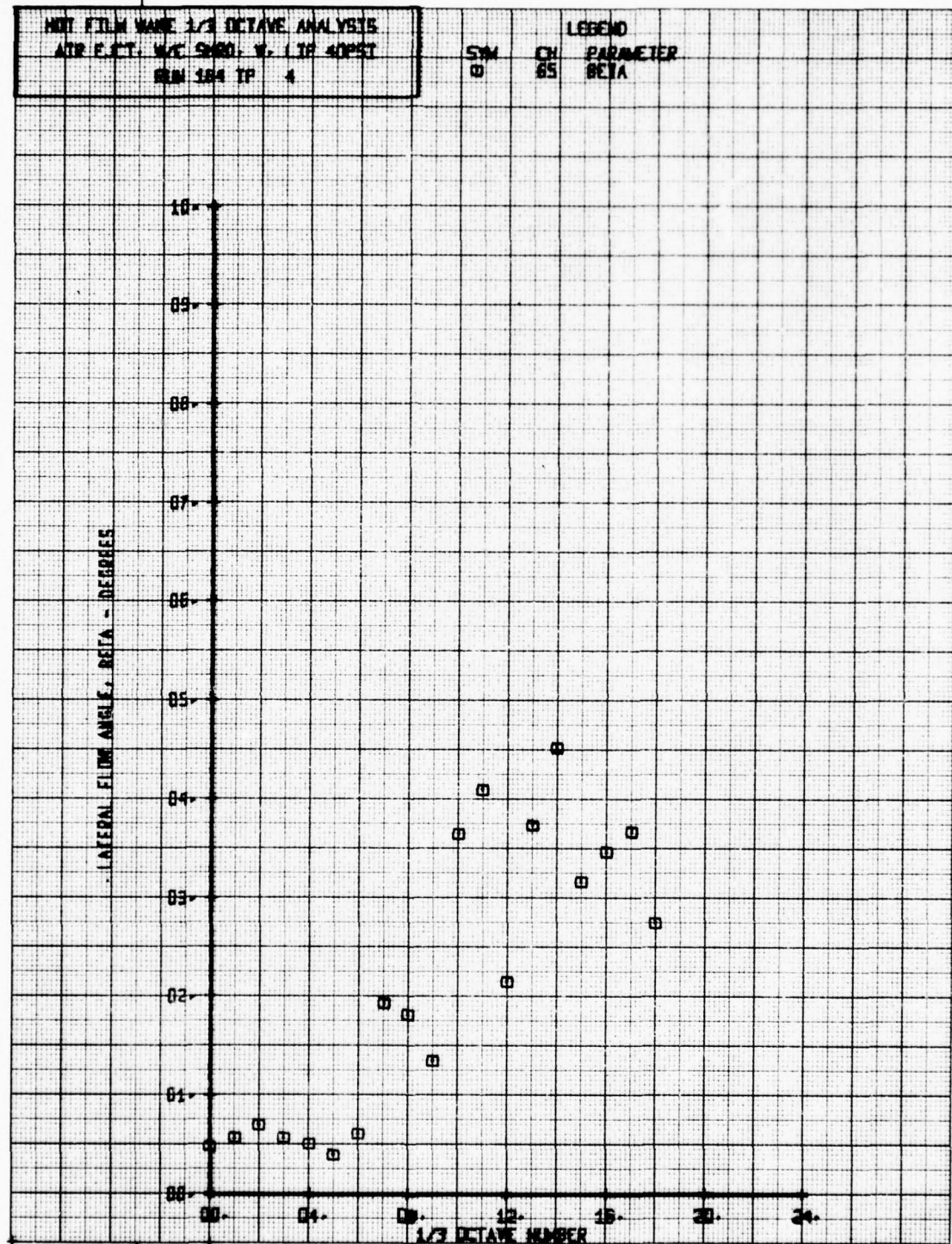
LEGEND  
 CH 65  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W.C. 5000. W. 1 TP 40PST  
 RUN 184 TP 4

SYM	CH	PARAMETER
0	65	BETA



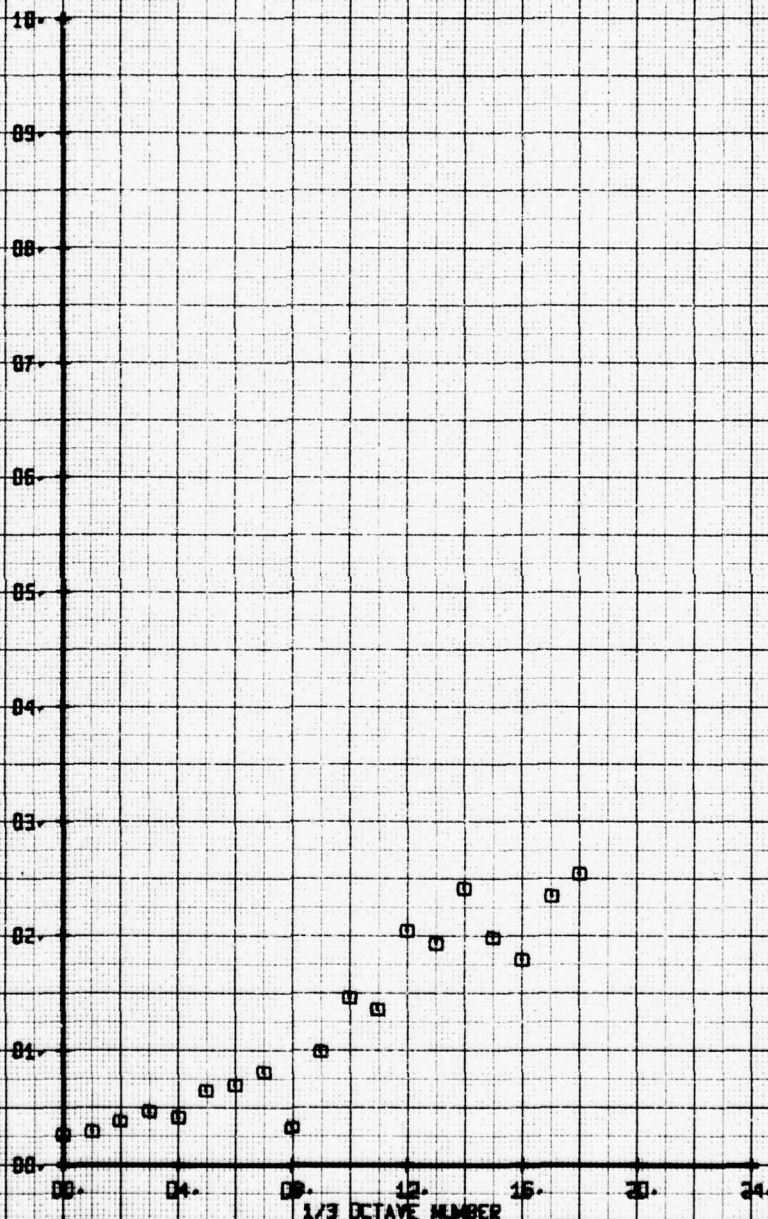
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C 5000 W. 11P 40P51  
 RUN 184 TP S

SIM  
 0

CH  
 05

LEGEND  
 PARAMETER  
 BETA

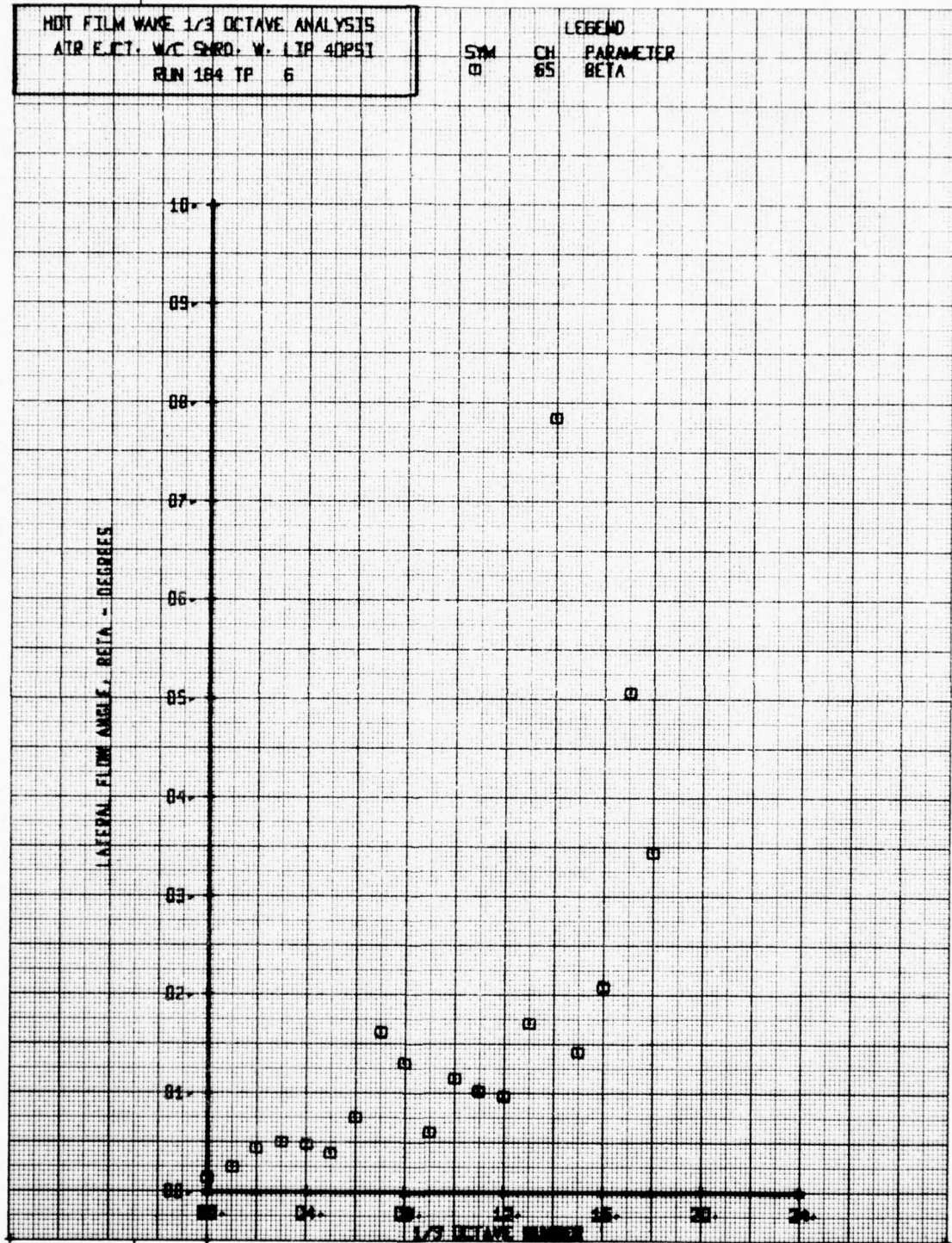
LATERAL FLOW ANGLE, BETA - DEGREES





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 ATR E.C.T. W.C. SHRO. W. LTP 40PST  
 RUN 184 TP 6

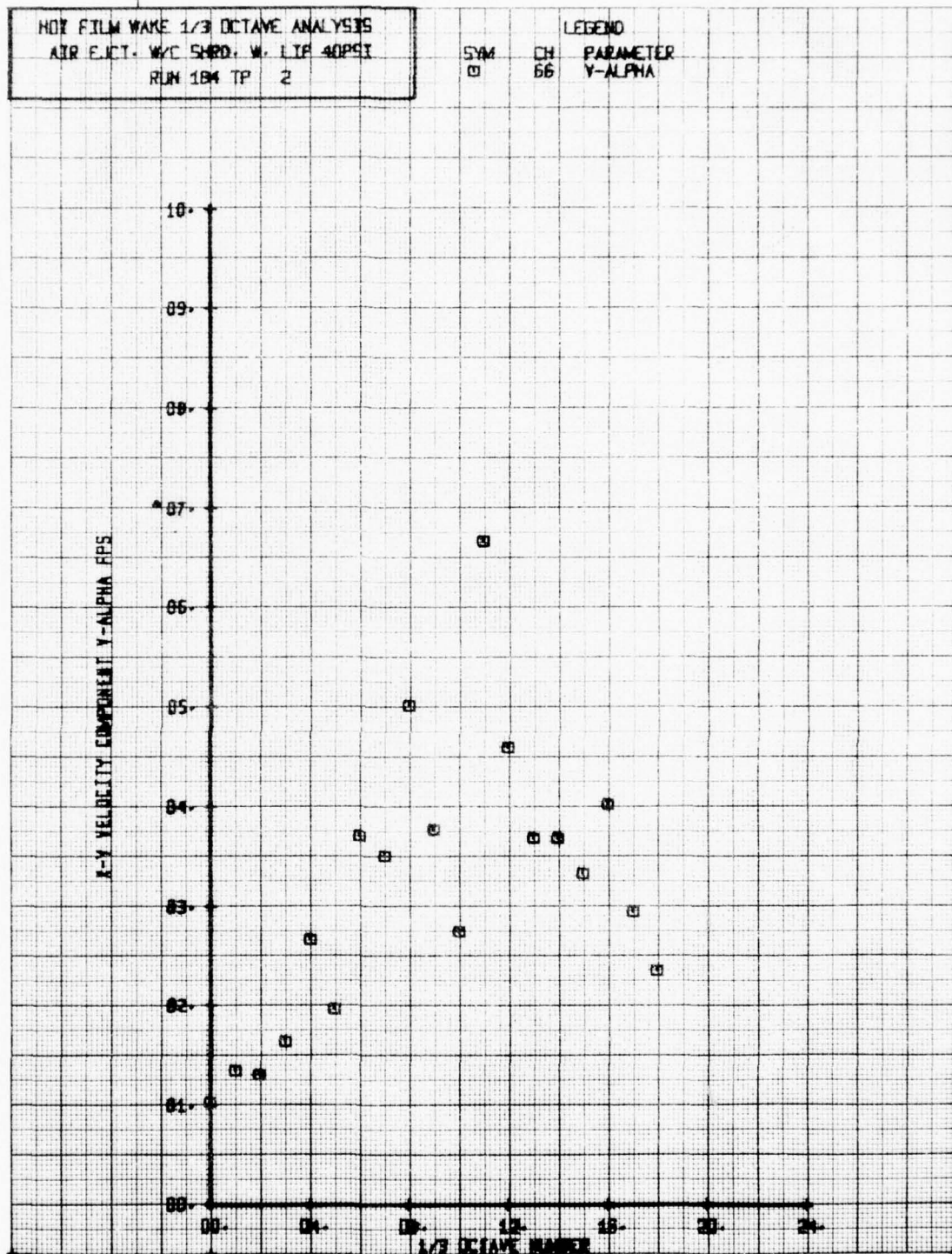
SYM	CH	LEGEND	PARAMETER
□	65	BETA	





NO7 FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRD. W. LIP 40PSI  
 RUN 184 TP 2

LEGEND  
 SYM CH PARAMETER  
 □ 66 Y-ALPHA

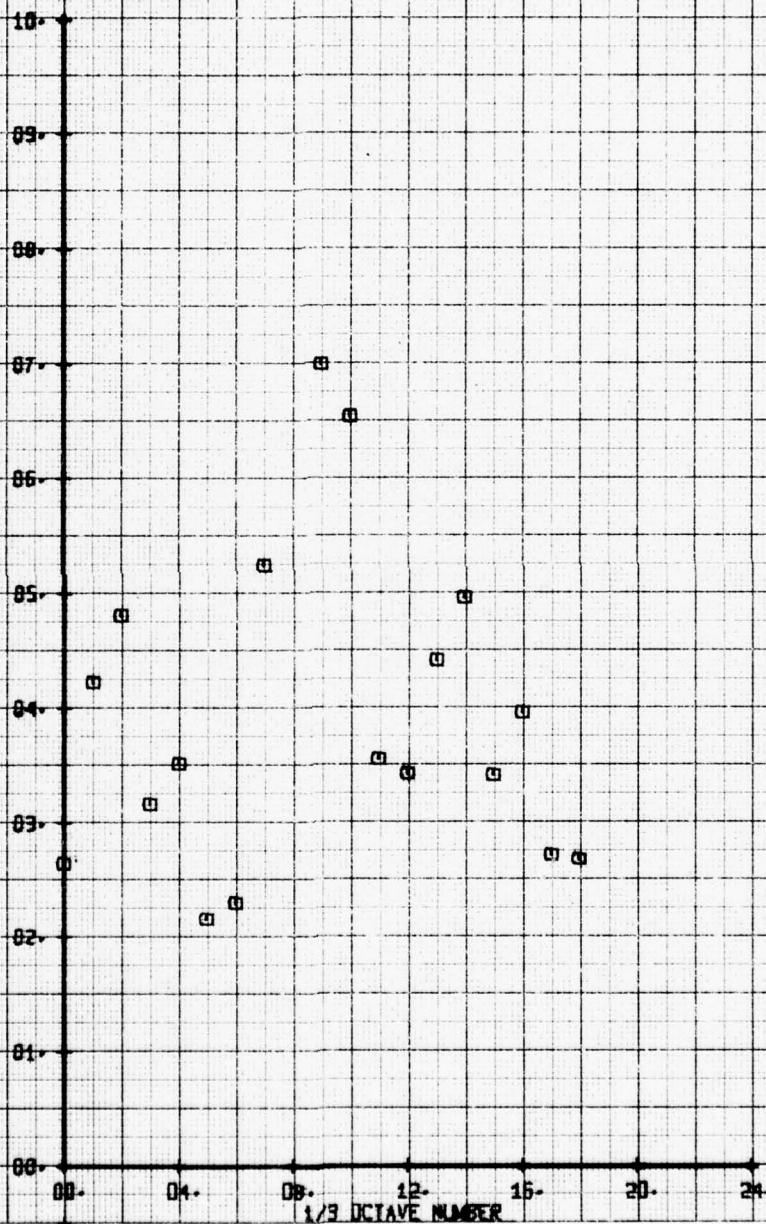


NOV FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR FCT. WTC 5MRD. W. LTP 40PSI  
 RUN 184 TP 3

SYM  
 □

LEGEND  
 CH  
 66  
 PARAMETER  
 Y-ALPHA

X-Y VELOCITY COMPONENT Y-ALPHA FPS



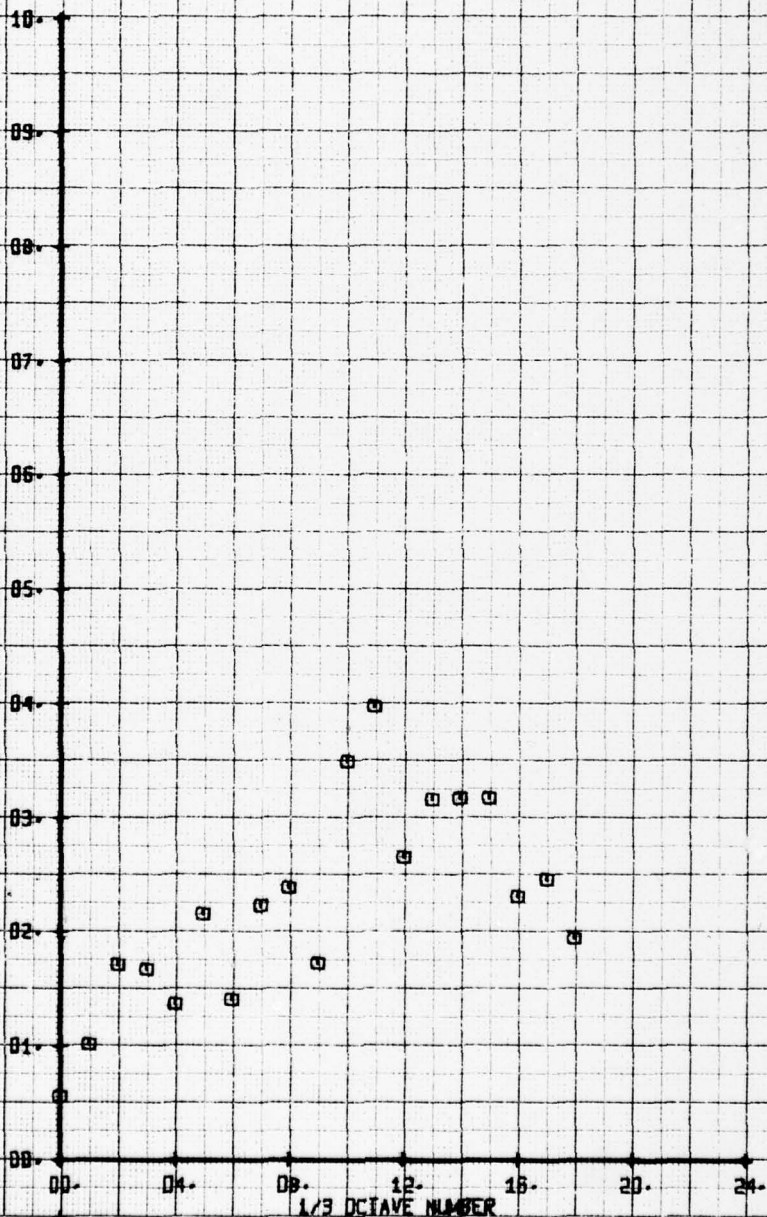
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR FLOW: WTC 5400, W. LTP 40PSI  
 RUN 184 TP 4

SWM  
 0

CH  
 56

LEGEND  
 PARAMETER  
 V-ALPHA

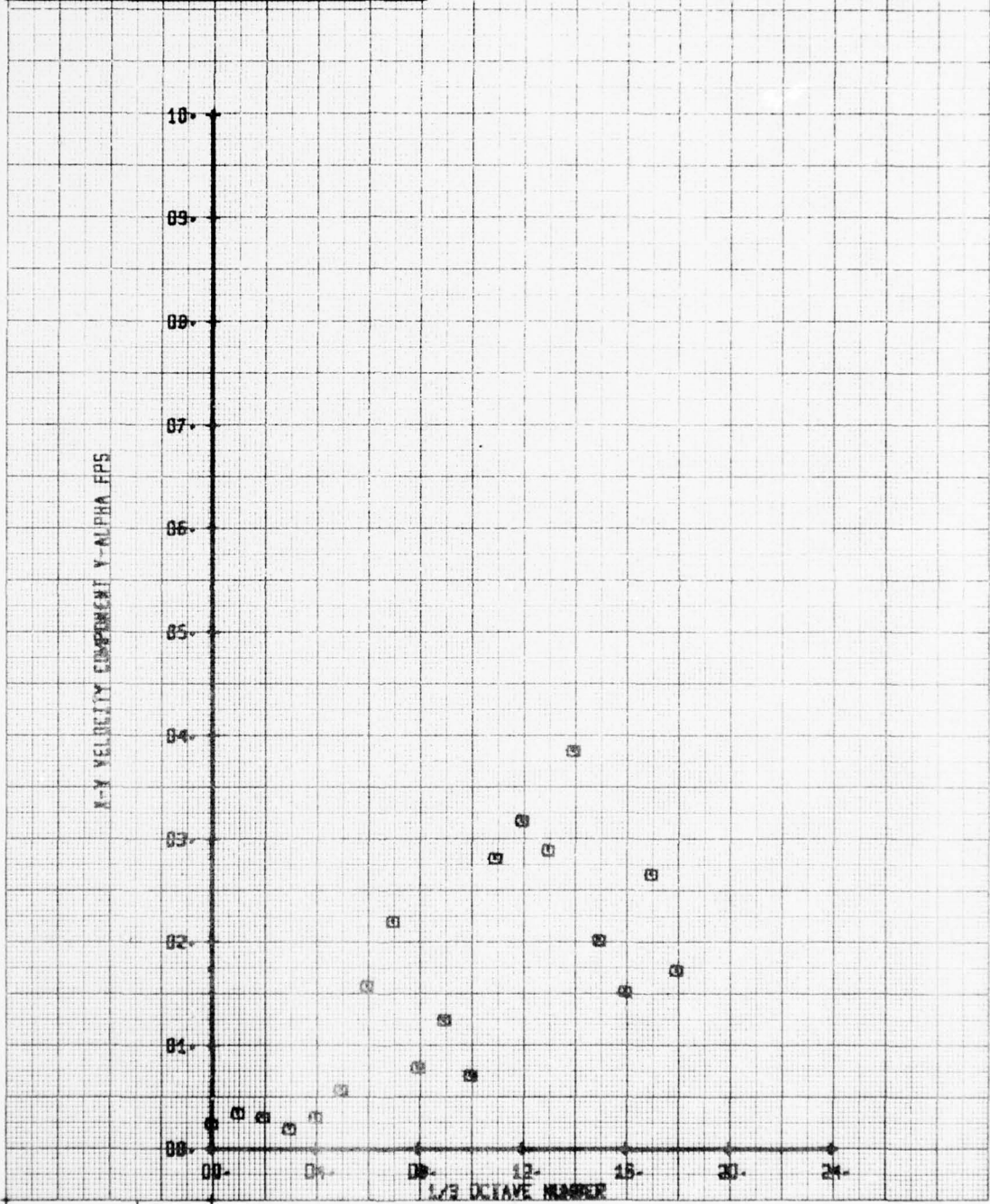
X-Y VELOCITY COMPONENT V-ALPHA FPS





NO1 FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR FLOW: WVC 5HRD. W. LTP 40PSI  
 RUN 184 TP 5

LEGEND  
 SYM CH PARAMETER  
 □ 66 Y-ALPHA





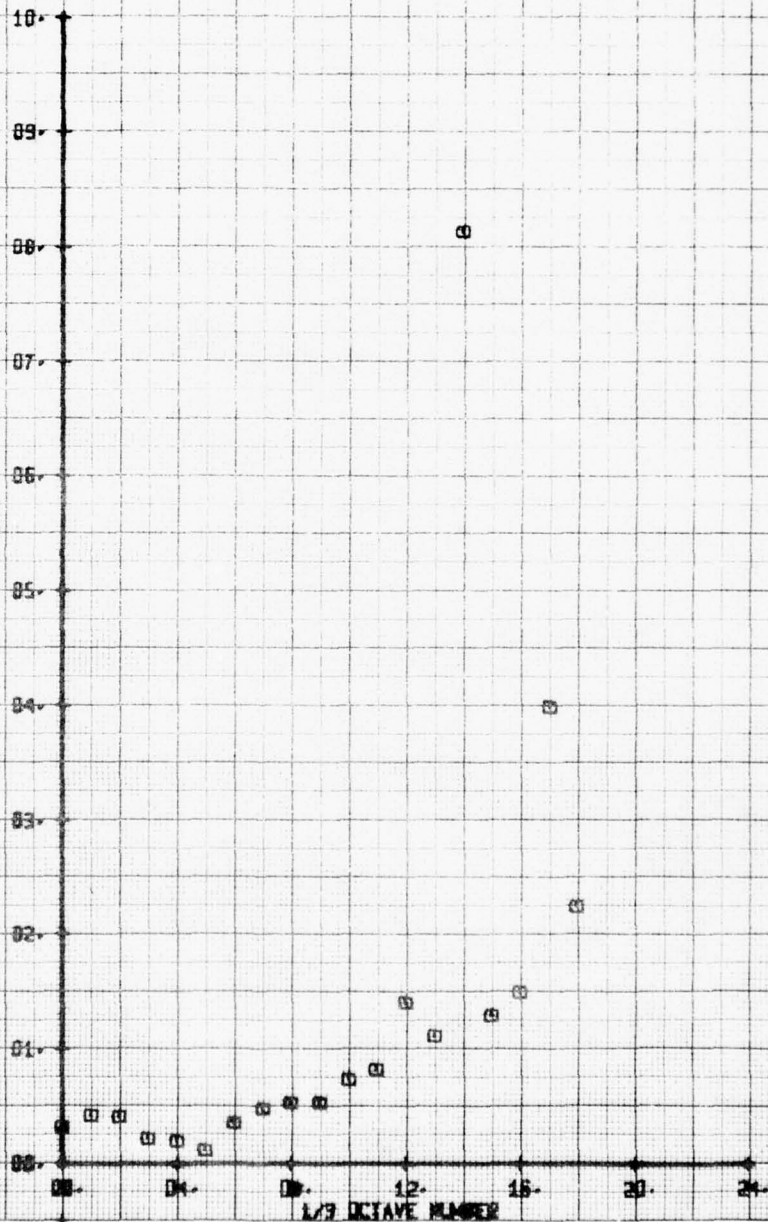
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRD. W. LIP 40PSI  
 RUN 184 TP 6

SYM  
 □

CH  
 66

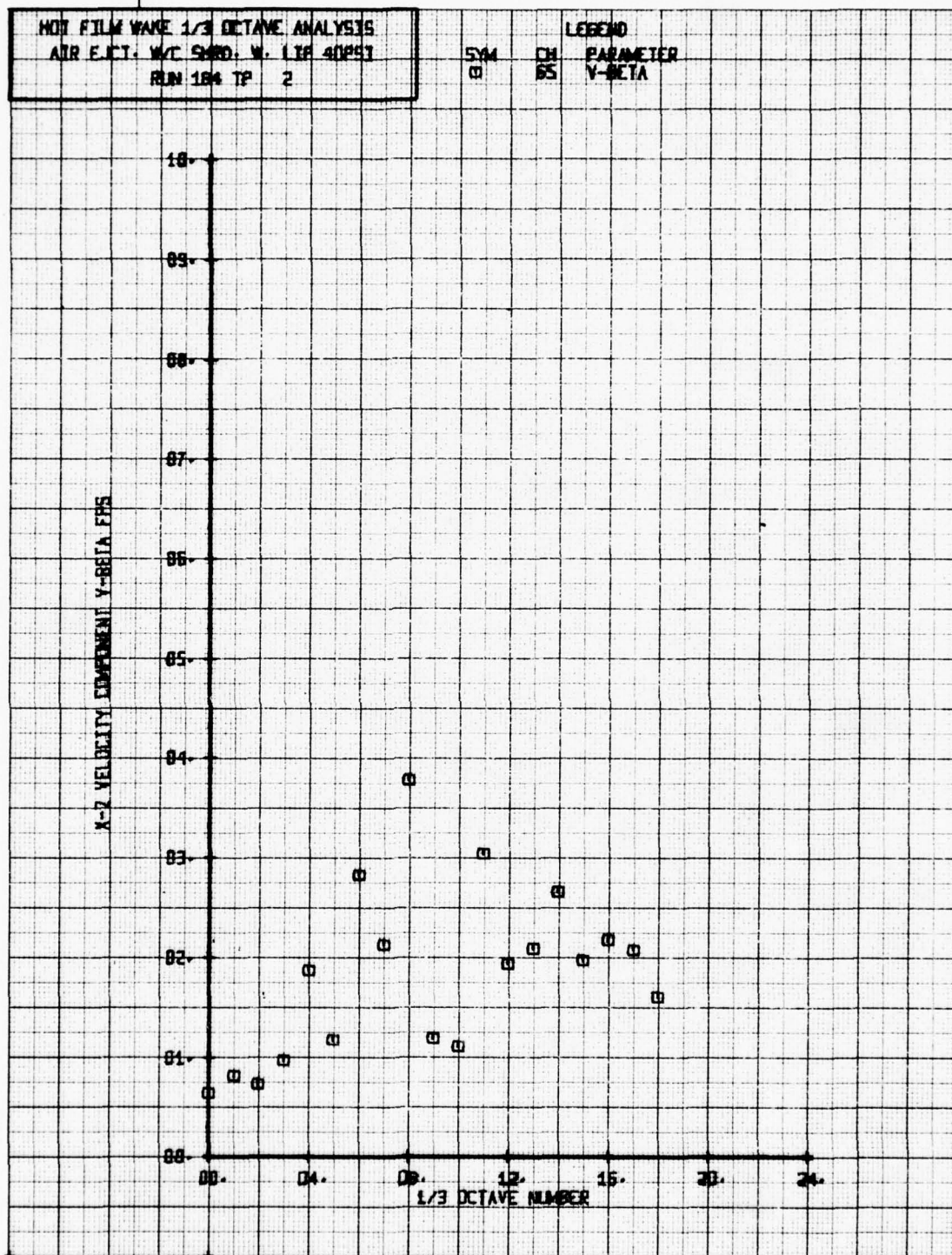
LEGEND  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



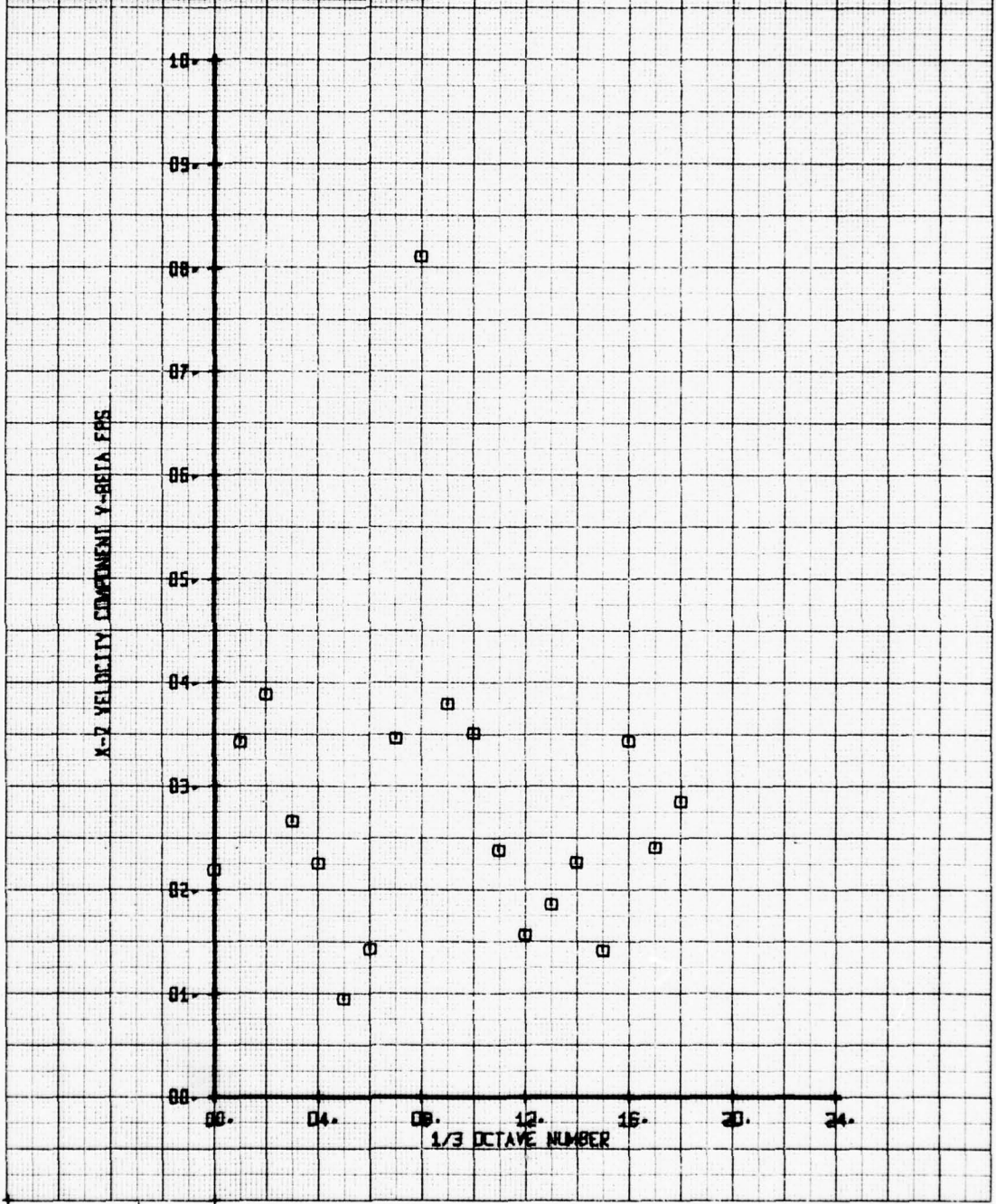
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR FCT. WTC 5480: W. 11P 40P51  
 RUN 184 TP 2

SYM CH PARAMETER  
 0 65 Y-BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W/C 5480. V. 1 TR 40PSI  
 RUN 184 TP 3

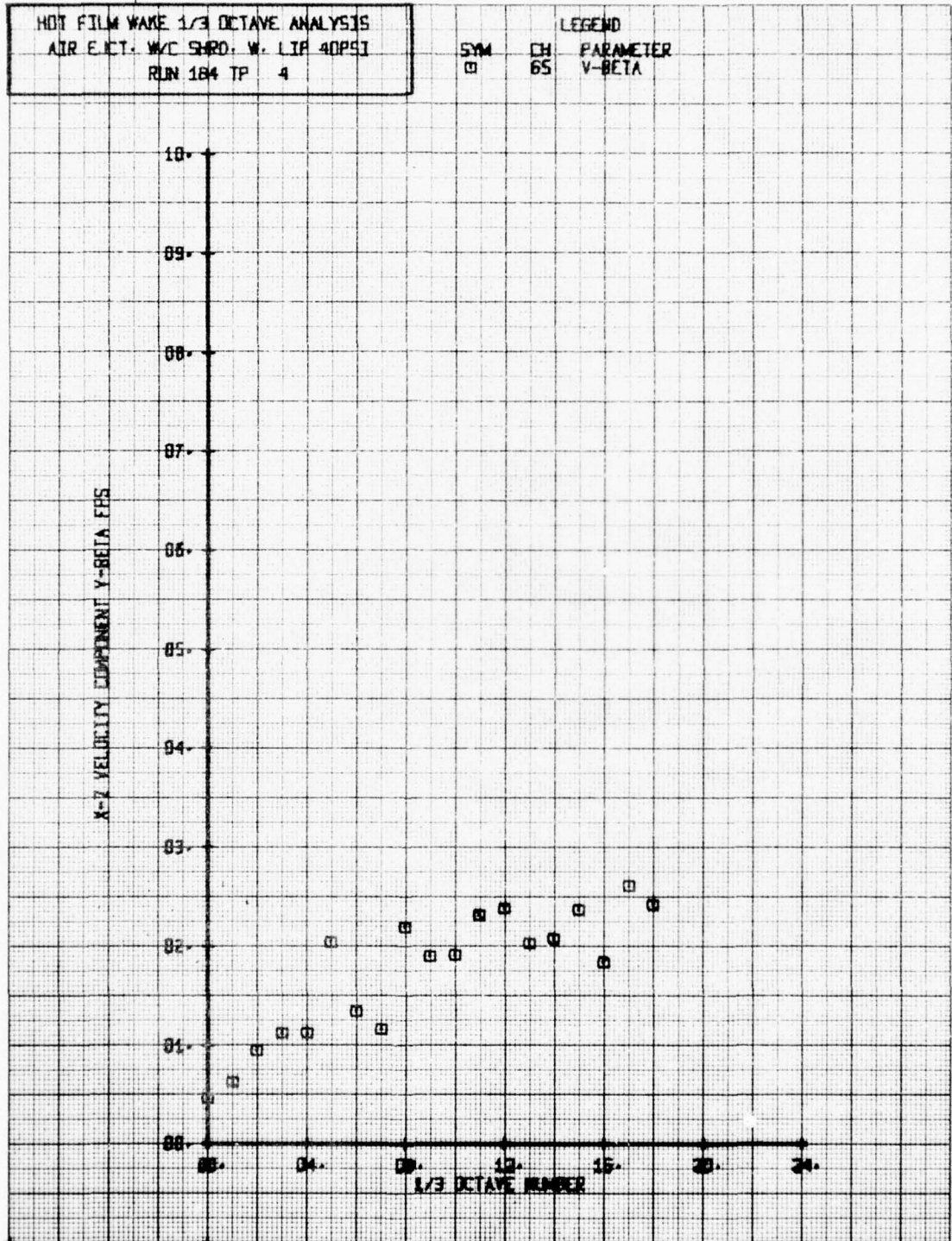
SYM	CH	PARAMETER
□	65	V-BETA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR E.C.T. W/C SHRO. W. LIP 40PSI  
 RUN 184 TP 4

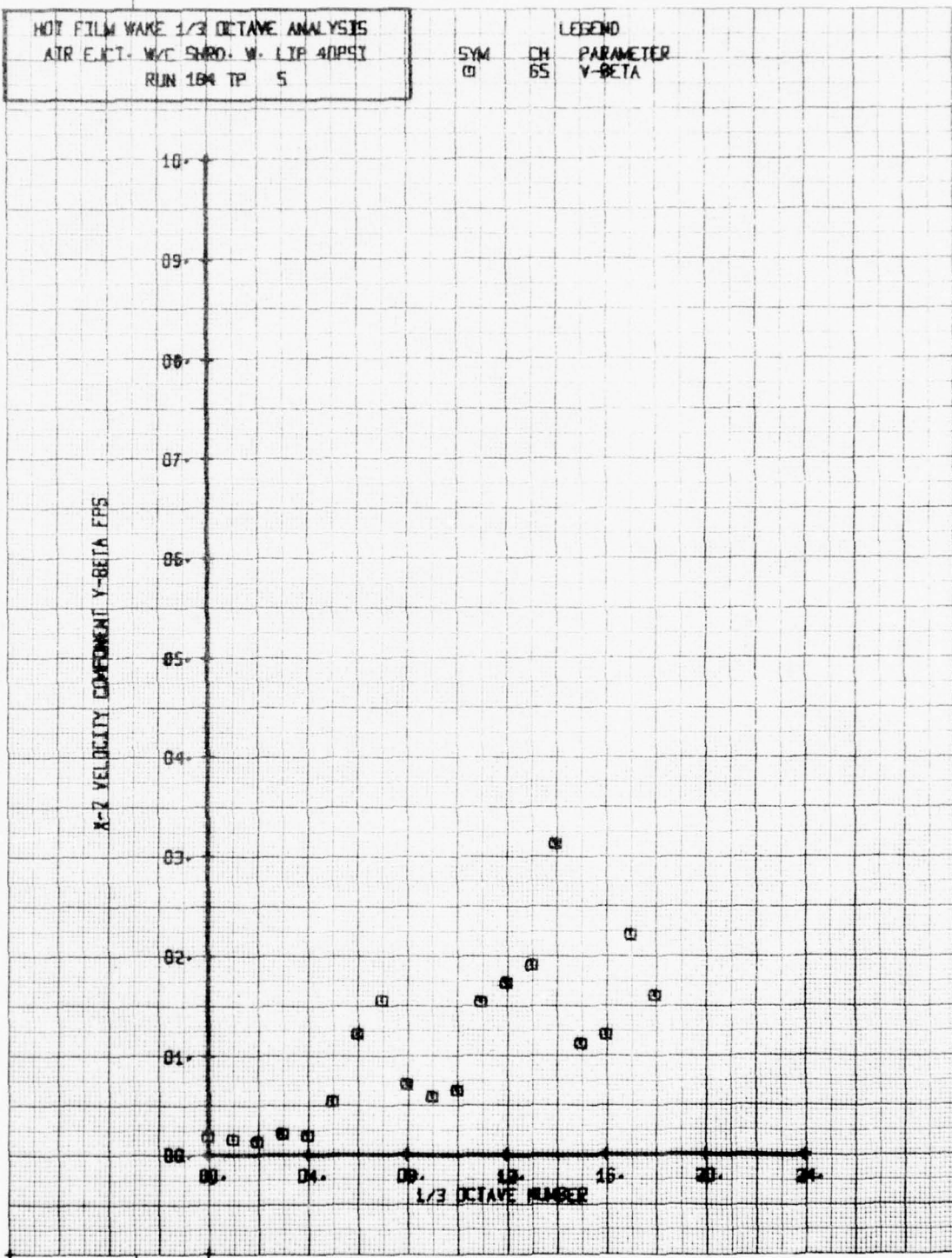
LEGEND  
 CH 65  
 PARAMETER  
 V-BETA





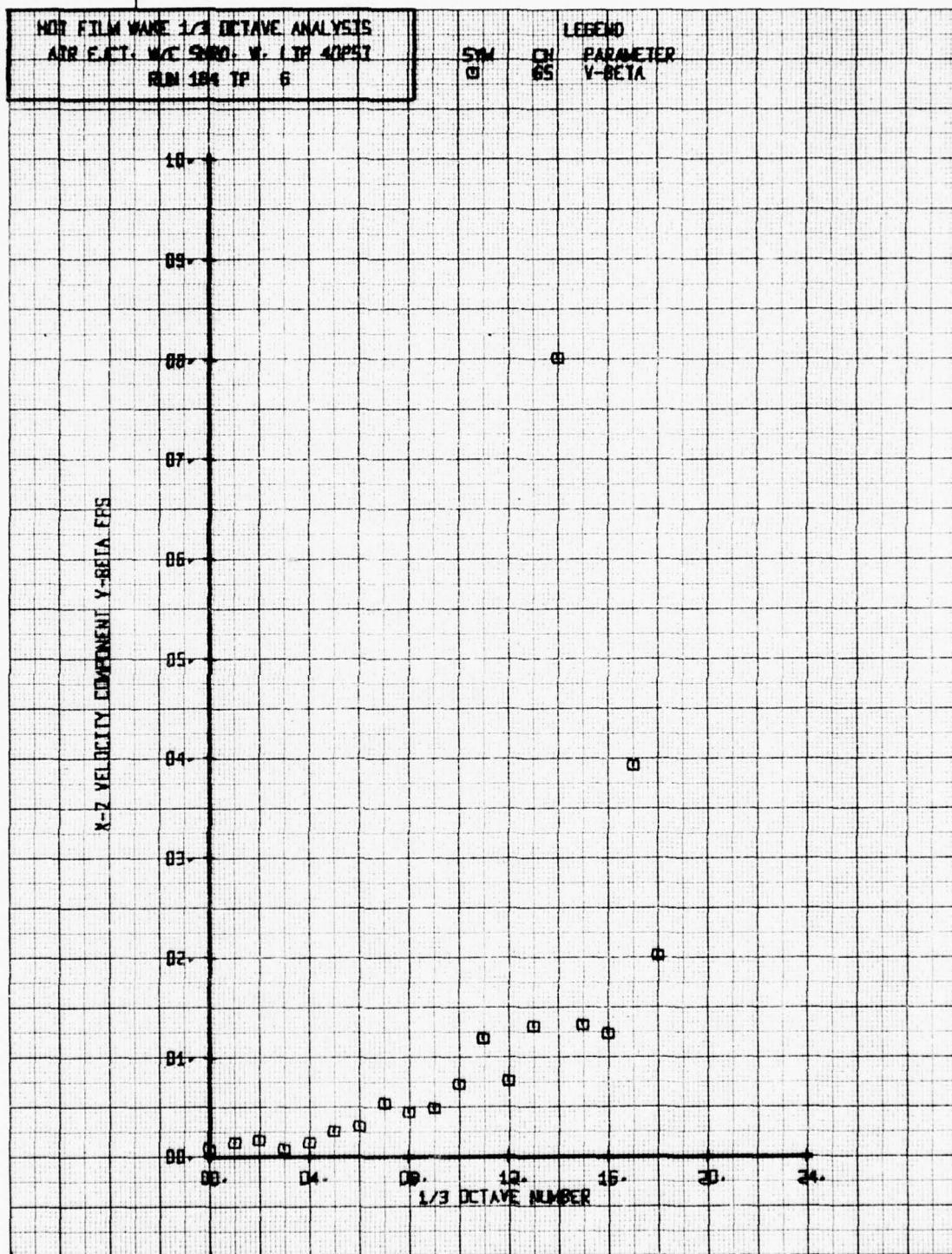
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. W. LIP 40PSI  
 RUN 184 TP 5

LEGEND  
 SYM CH PARAMETER  
 □ 65 Y-BETA



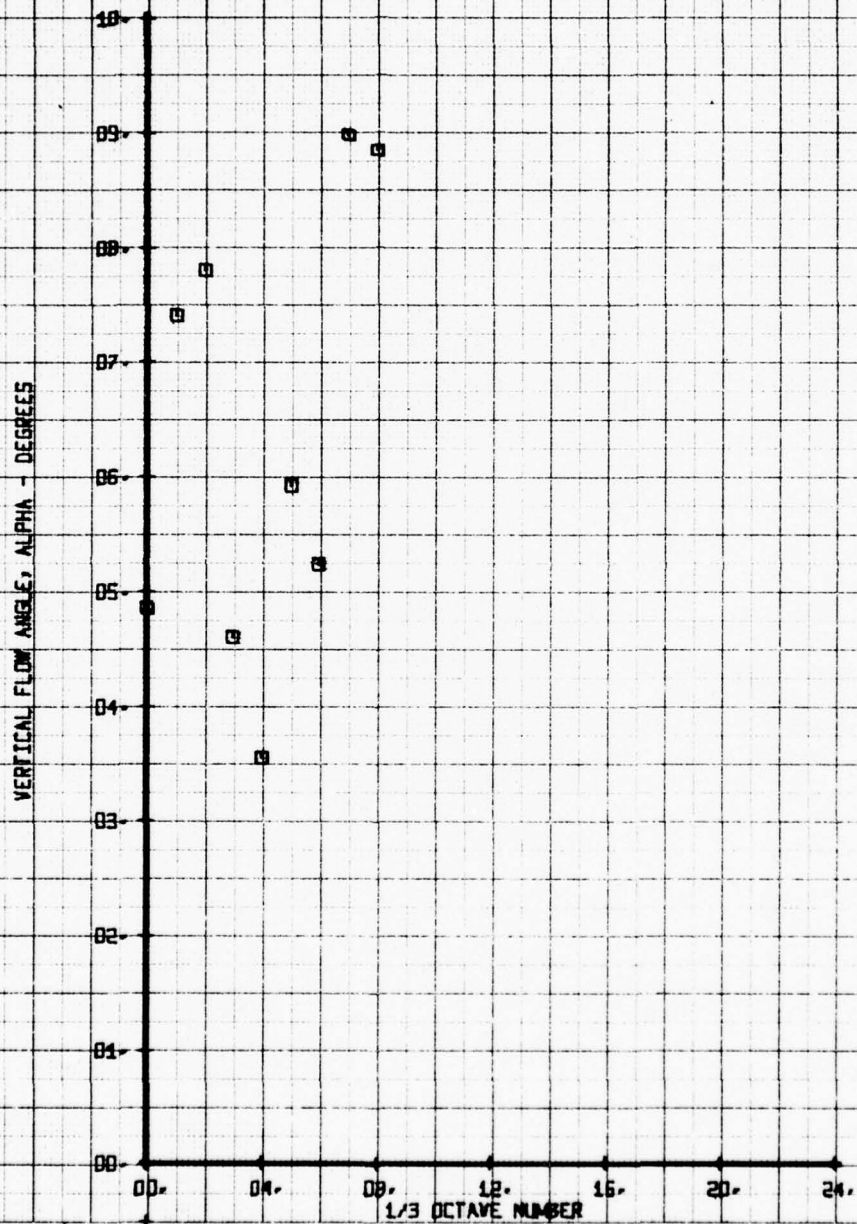
HOR FILM WAVE 1/3 OCTAVE ANALYSIS  
 ARR F.C.T. W.C. 5000. W. / TP 40P57  
 RUN 184 TP 6

LEGEND  
 CH 65  
 PARAMETER  
 V-BETA



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 ATR ECT. W/C SHRO. W. LTP 150PST  
 RUN 185 TP 1

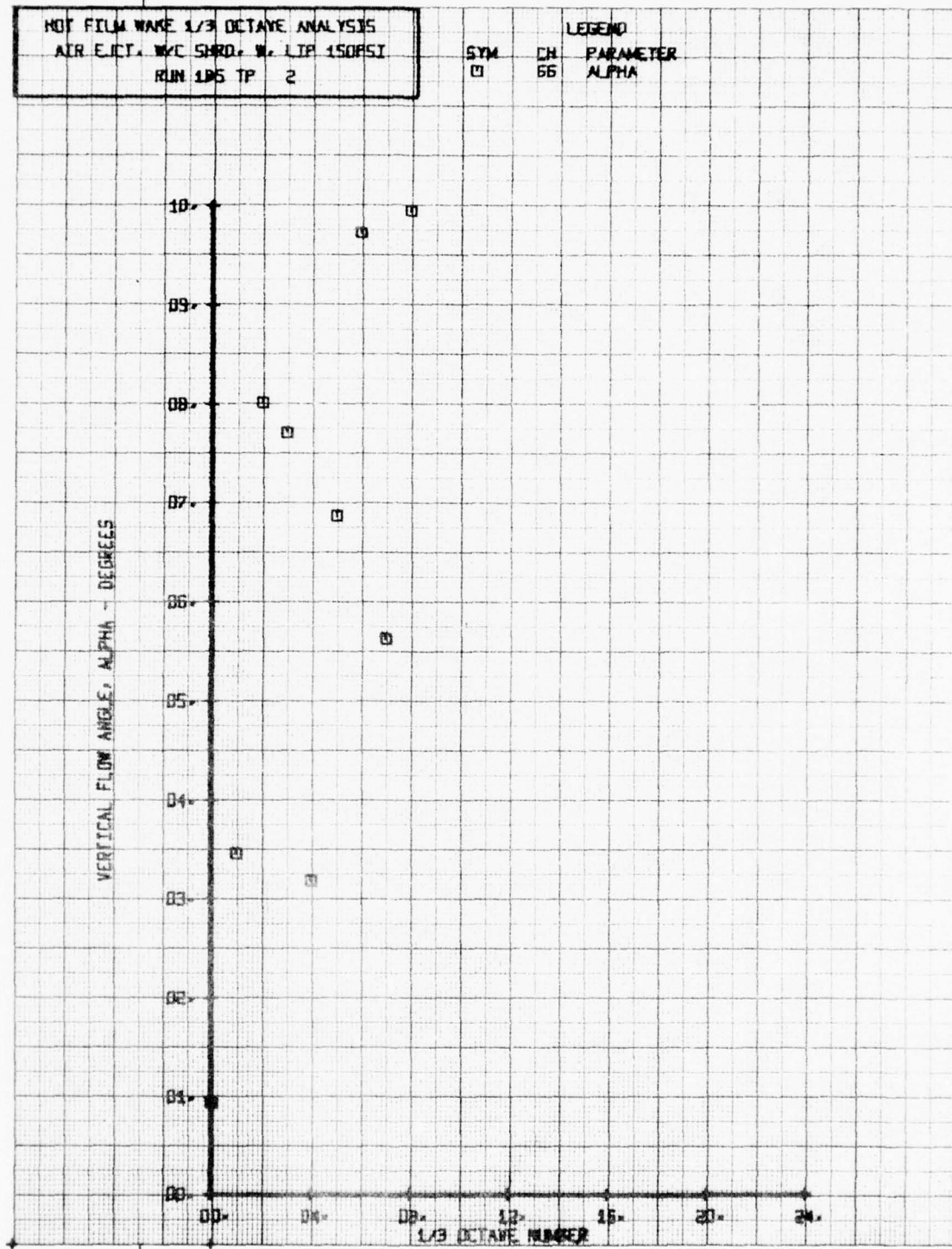
SYN CH  
 0 55  
 LEGEND  
 PARAMETER  
 ALPHA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR ECT. W/C SHRD. W. LIP 150PSI  
 RUN 185 TP 2

SYM CH PARAMETER  
 □ 66 ALPHA





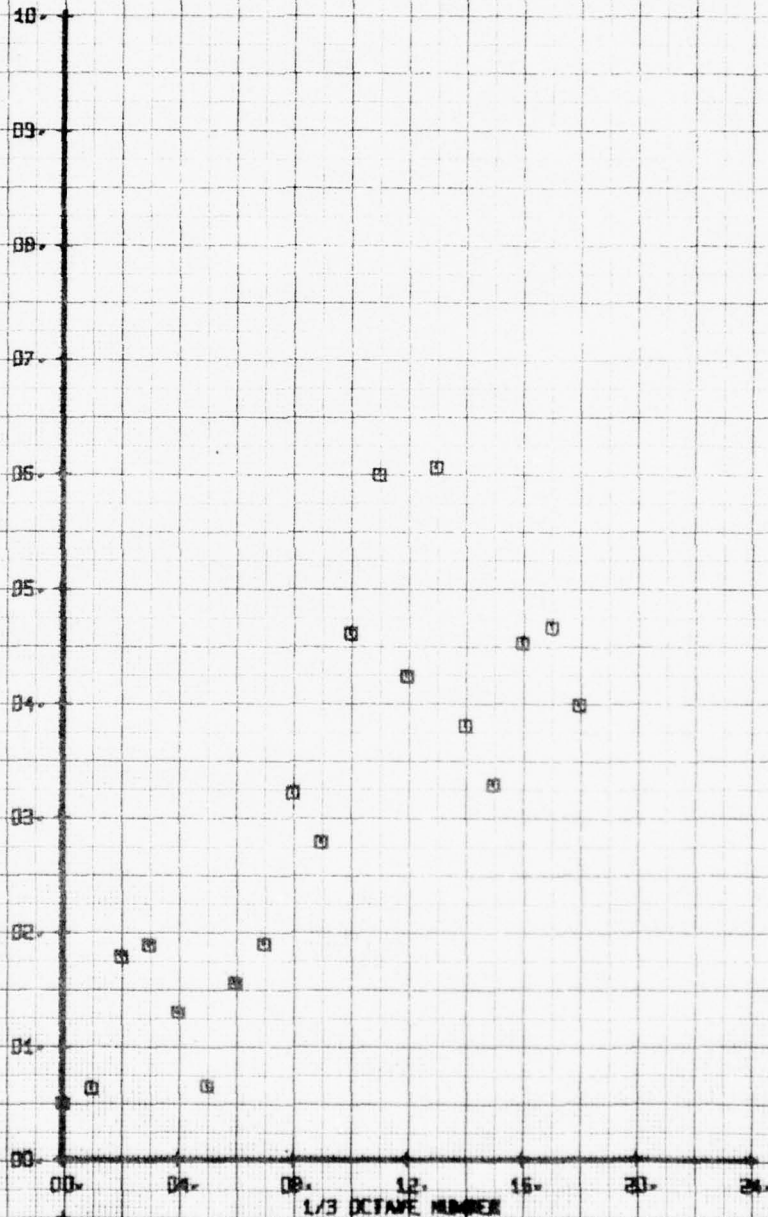
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRD. W. LTP 150P51  
 RUN 185 TP 3

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 ALPHA

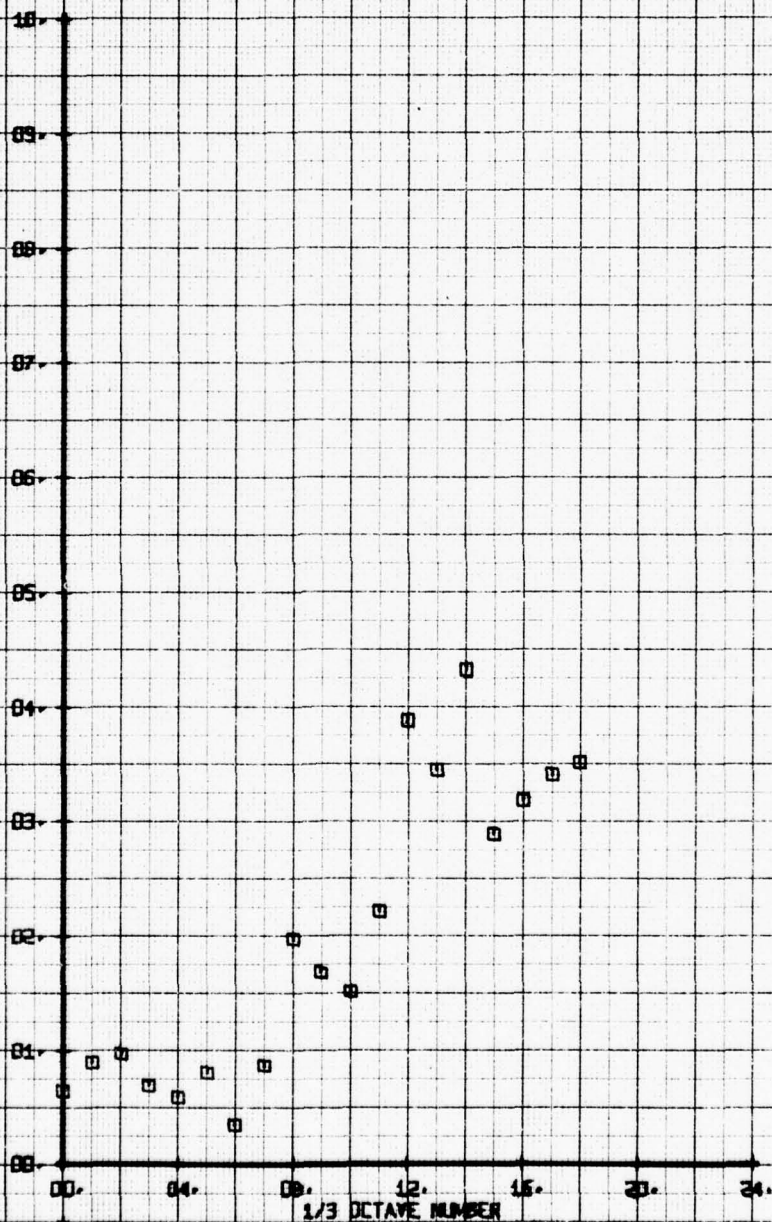
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W.C. SMO. V. 1 IF 150RST  
 RUN 105 TP 4

LEGEND  
 SYM CH PARAMETER  
 □ 66 ALPHA

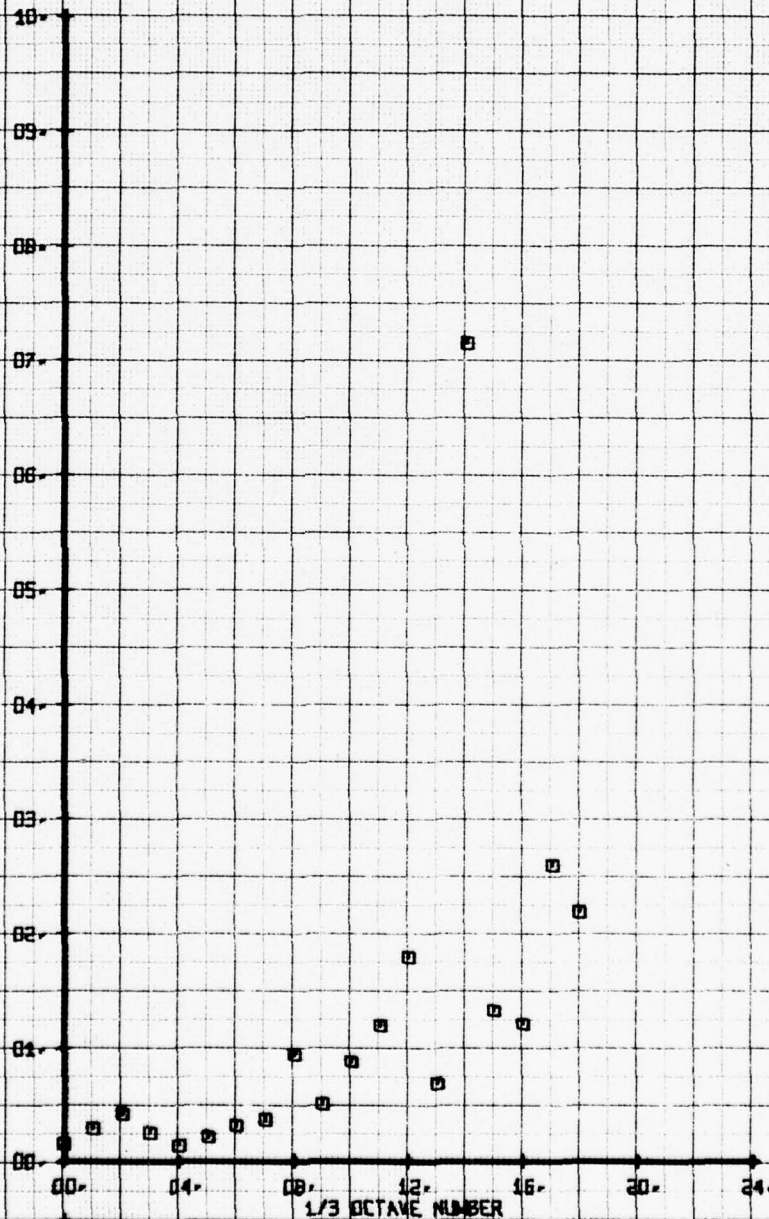
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR FLOW: W/C SHRO. W. 1 TP 150FST  
 RUN 185 TP 5

LEGEND  
 CH 66  
 PARAMETER ALPHA

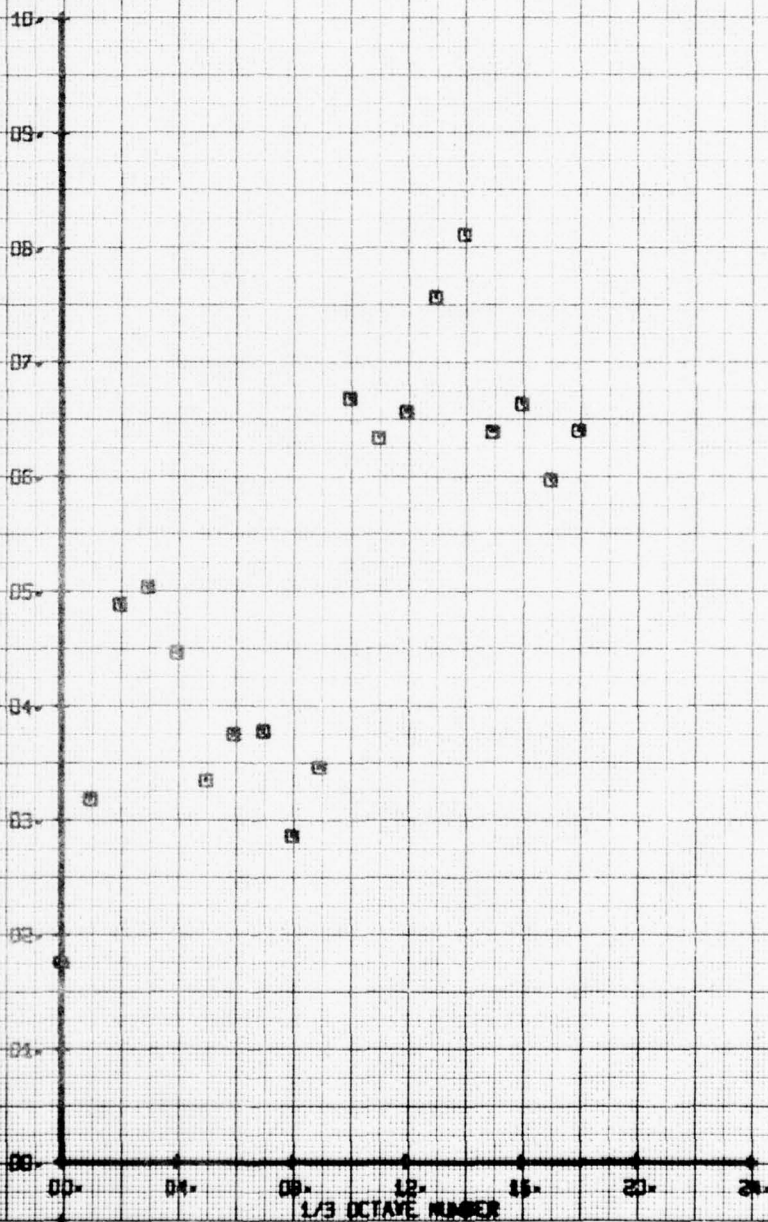
VERTICAL FLOW ANGLE, ALPHA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. WVC SHRD. W. LTP 150PSI  
 RUN 185 TP 1

LEGEND  
 CH 65  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



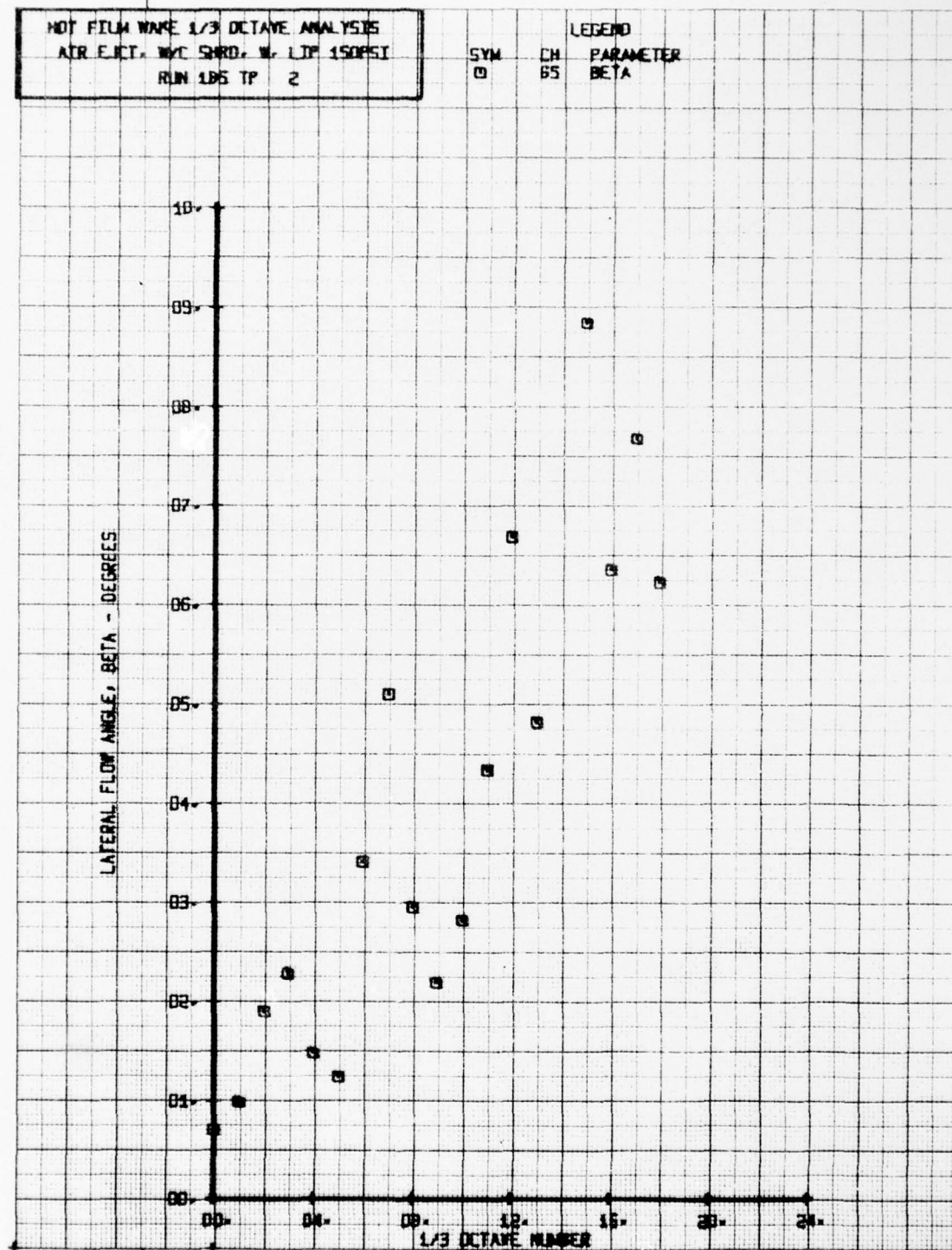


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 ATR ECT. WVC SHRD. W. LTP 150PSI  
 RUN 185 TP 2

SYM  
 0

CH  
 65

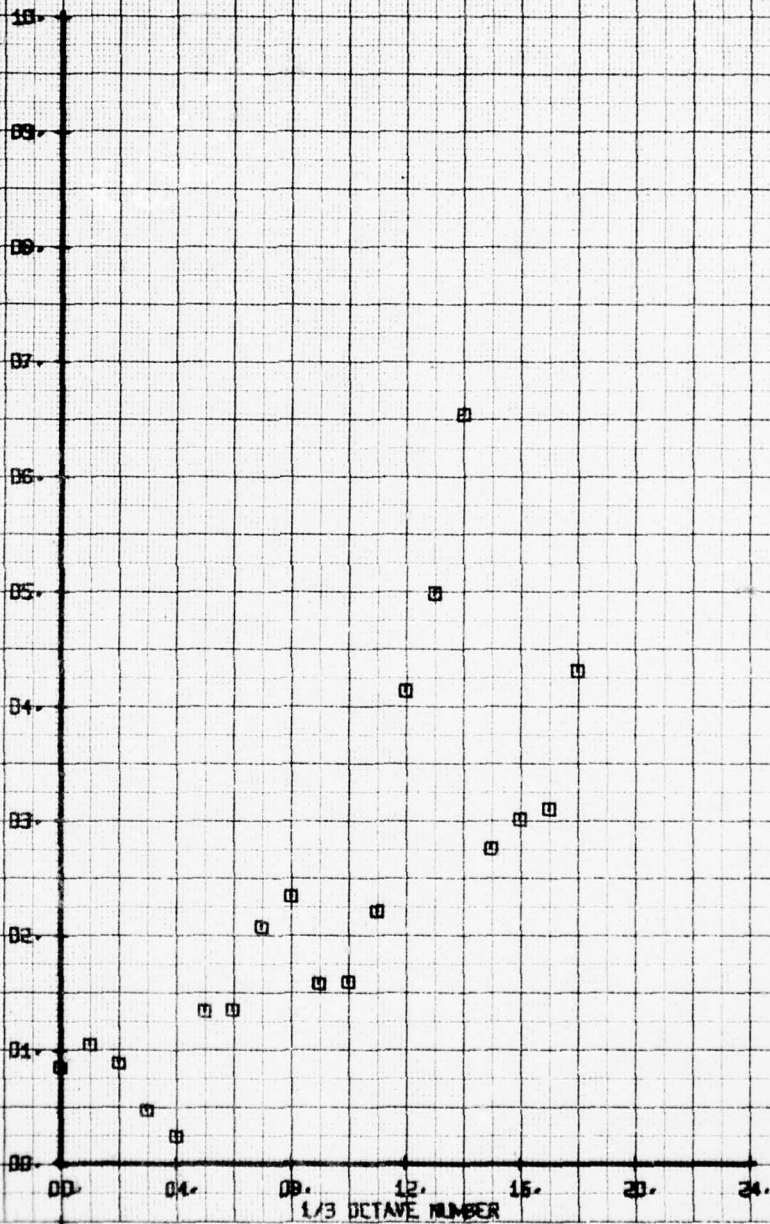
LEGEND  
 PARAMETER  
 BETA



NOI FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR ECT. WAVE SMO. 1. 11P 150PST  
 RUN LOG TP 3

SYN CH  
 05 05  
 PARAMETER  
 BETA

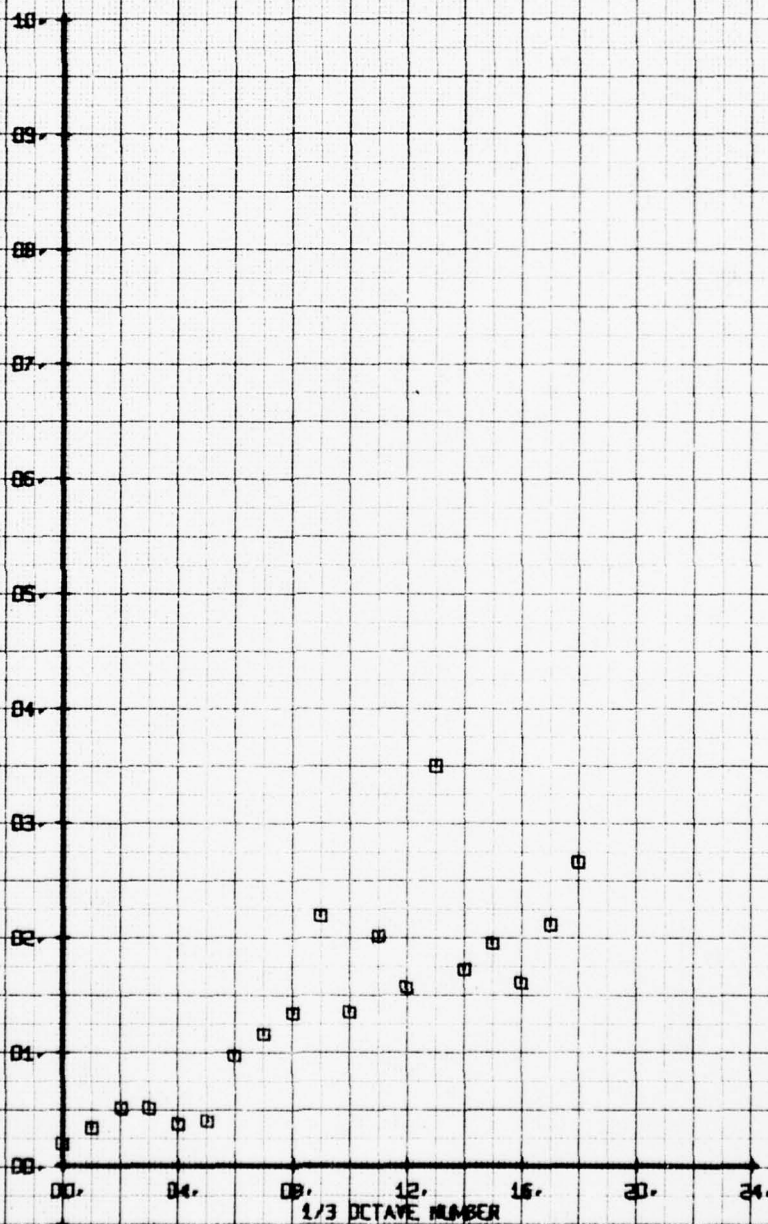
LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR ECT. W/C SHRO. W. 1 TP 150RST  
 RUN 185 TP 4

LEGEND	
SYM	CH
□	65
	PARAMETER
	BETA

LATERAL FLOW ANGLE, BETA - DEGREES

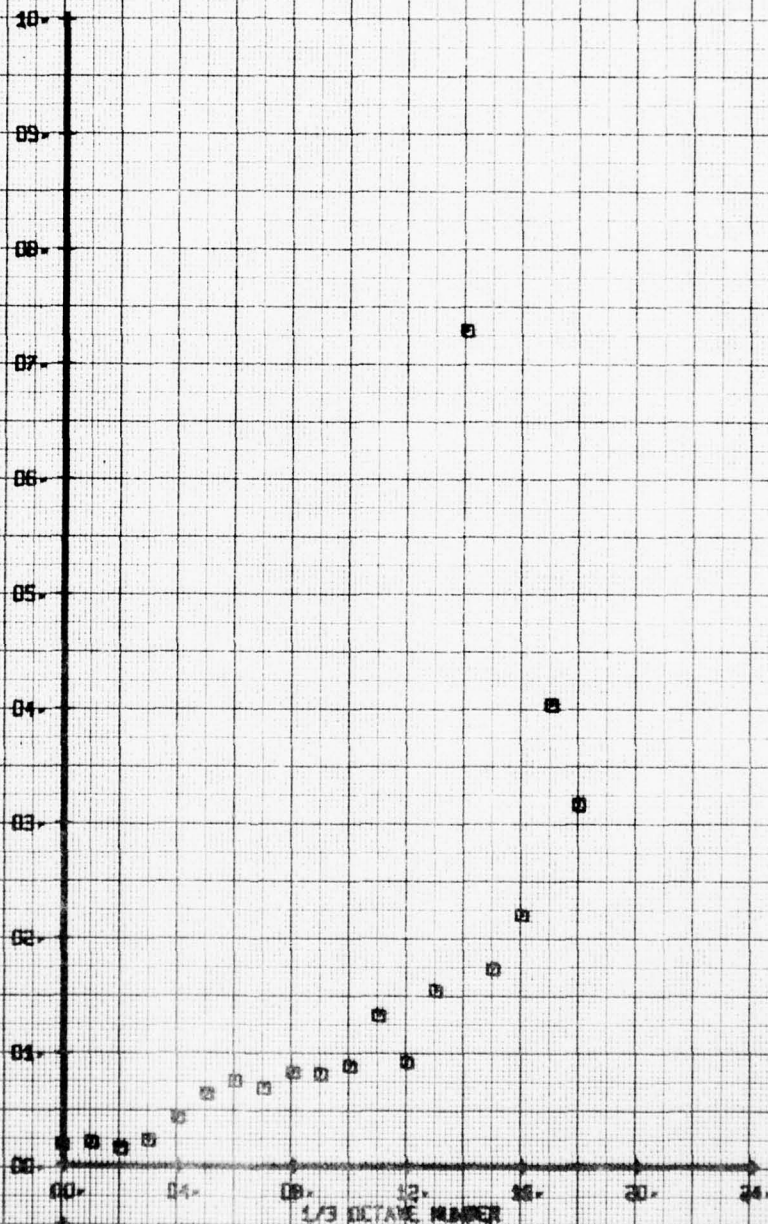




NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 ATR E.C.T. W/C SHRO. W. LTP 150PST  
 RUN 185 TP 5

LEGEND	
SYM	CH
6	65
	PARAMETER
	BETA

LATERAL FLOW ANGLE, BETA - DEGREES

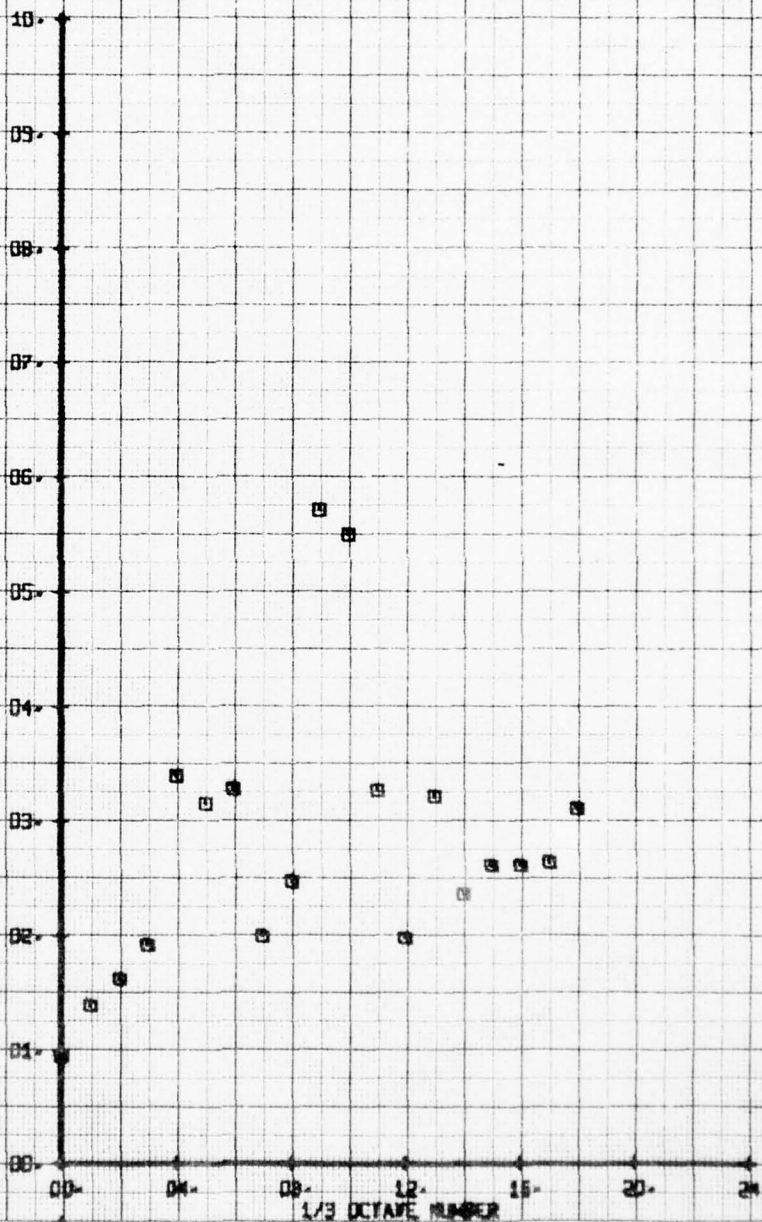




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRD. W. LIP 150PSI  
 RUN 185 TP 1

SYM CH PARAMETER  
 □ 66 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS



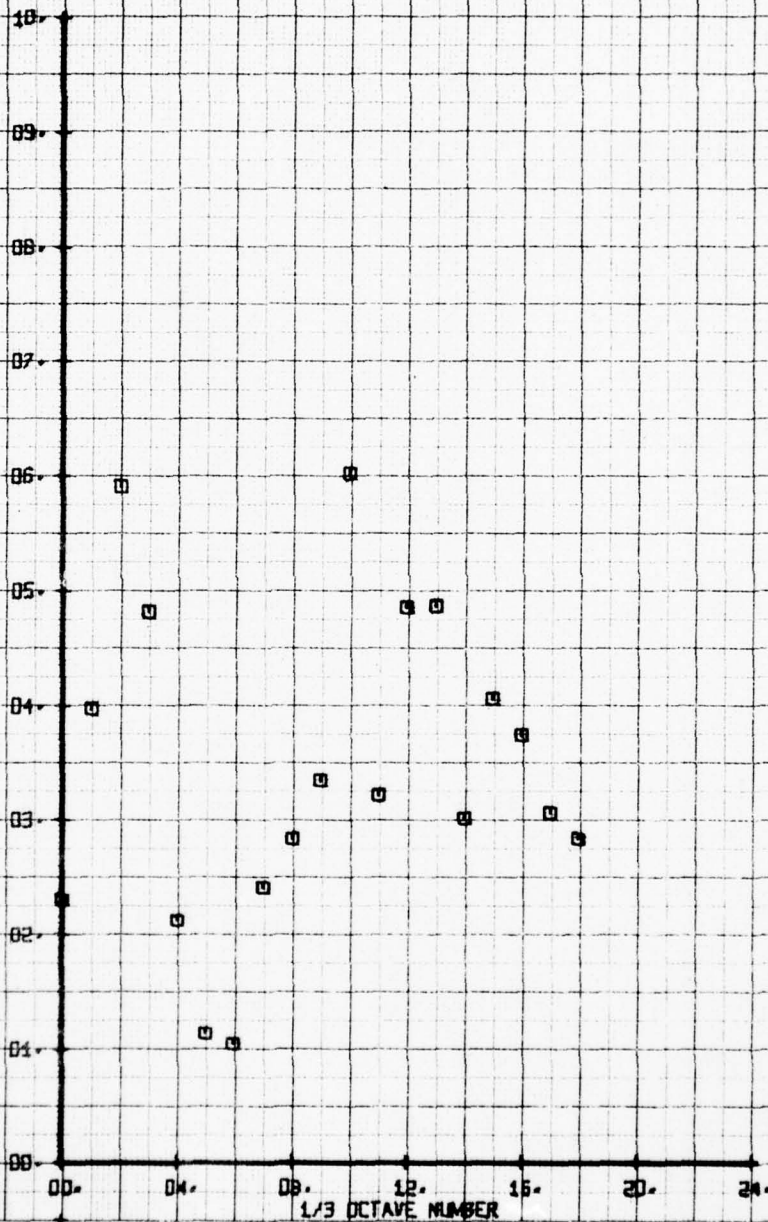
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W/C SHRD. W. 1 IP 150PSI  
 RUN 105 TP 2

SYM  
 □

CH  
 56

LEGEND  
 PARAMETER  
 Y-ALPHA

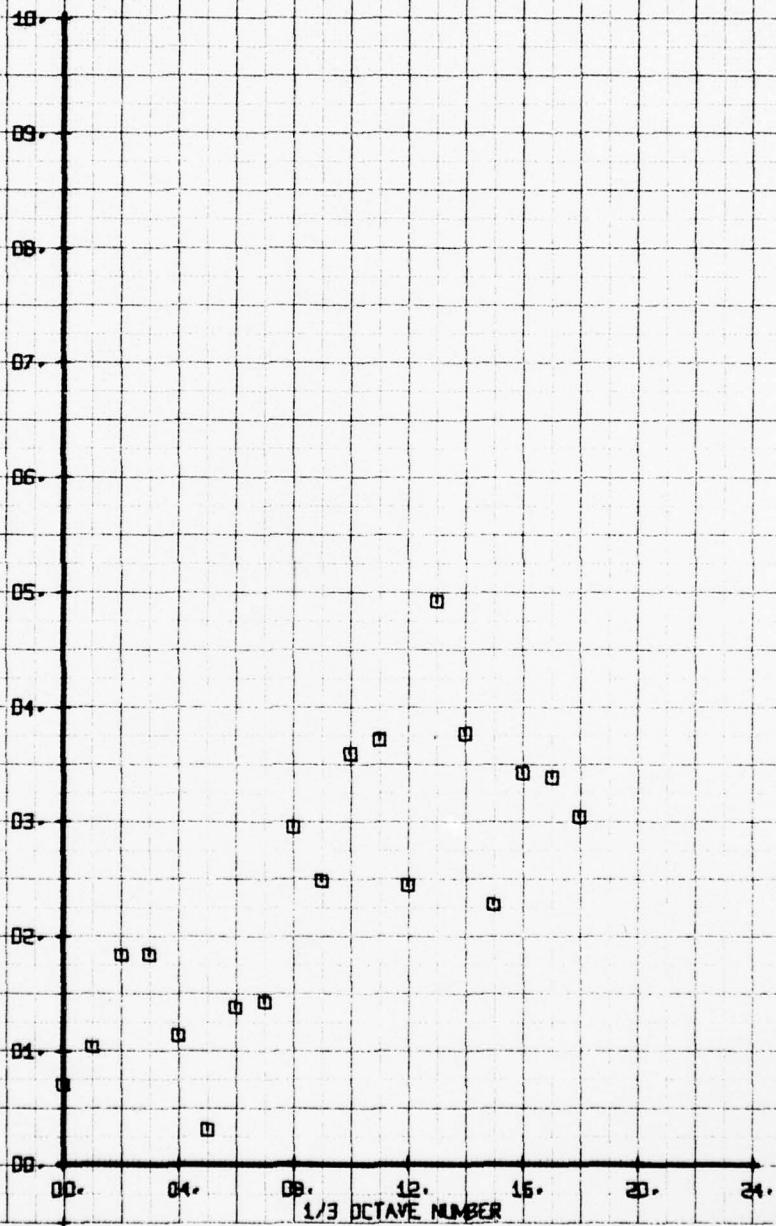
K-Y VELOCITY COMPONENT Y-ALPHA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR ECT. W/C SNRD. W. LIP 150PSI  
 RUN 185 TP 3

LEGEND  
 SYM CH PARAMETER  
 □ 66 V-ALPHA

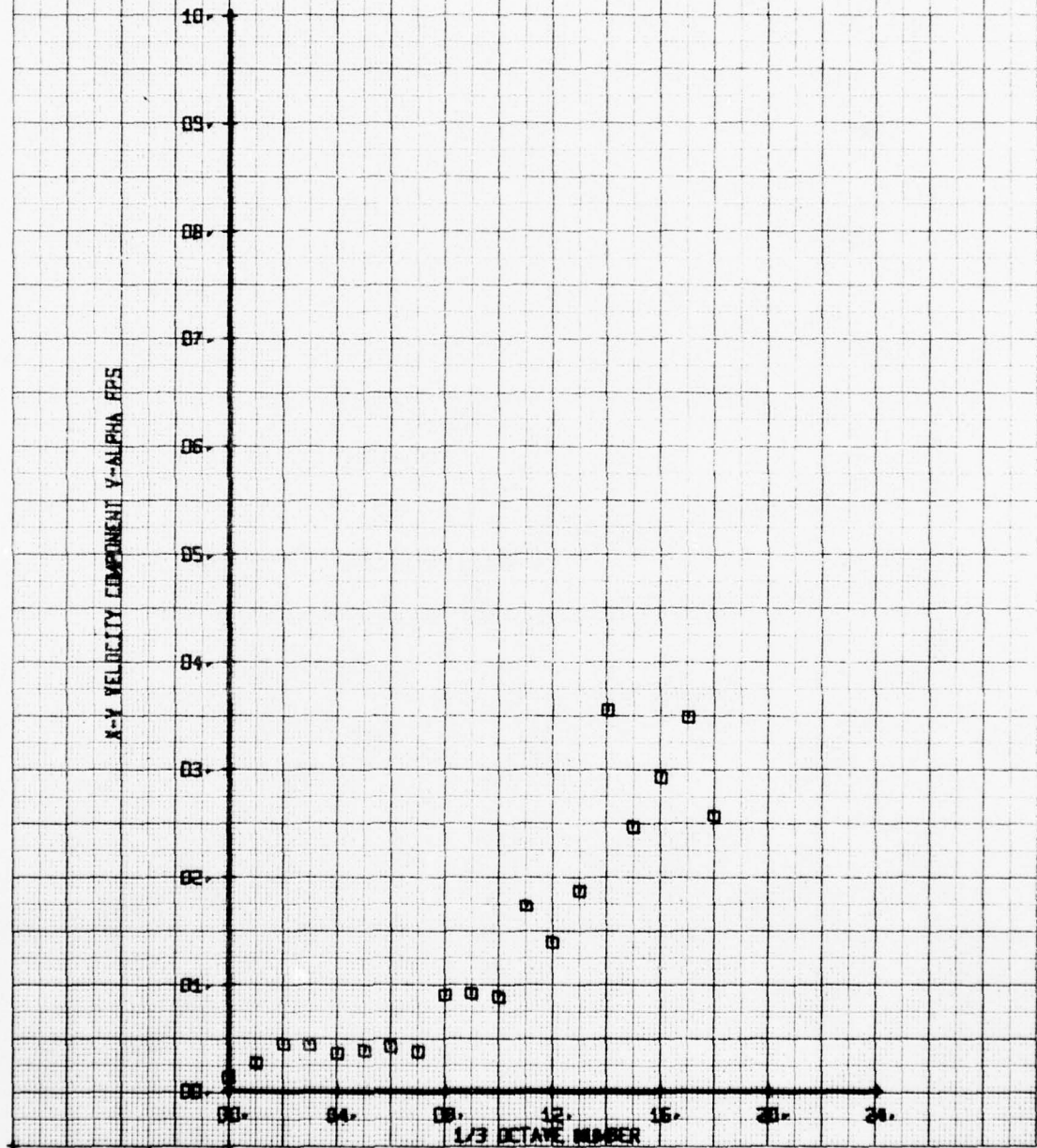
X-Y VELOCITY COMPONENT V-ALPHA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR FLOW: W/C SHRO. W. I/P 150PSI  
 RUN 185 TP 4

LEGEND  
 CH 66  
 PARAMETER  
 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS





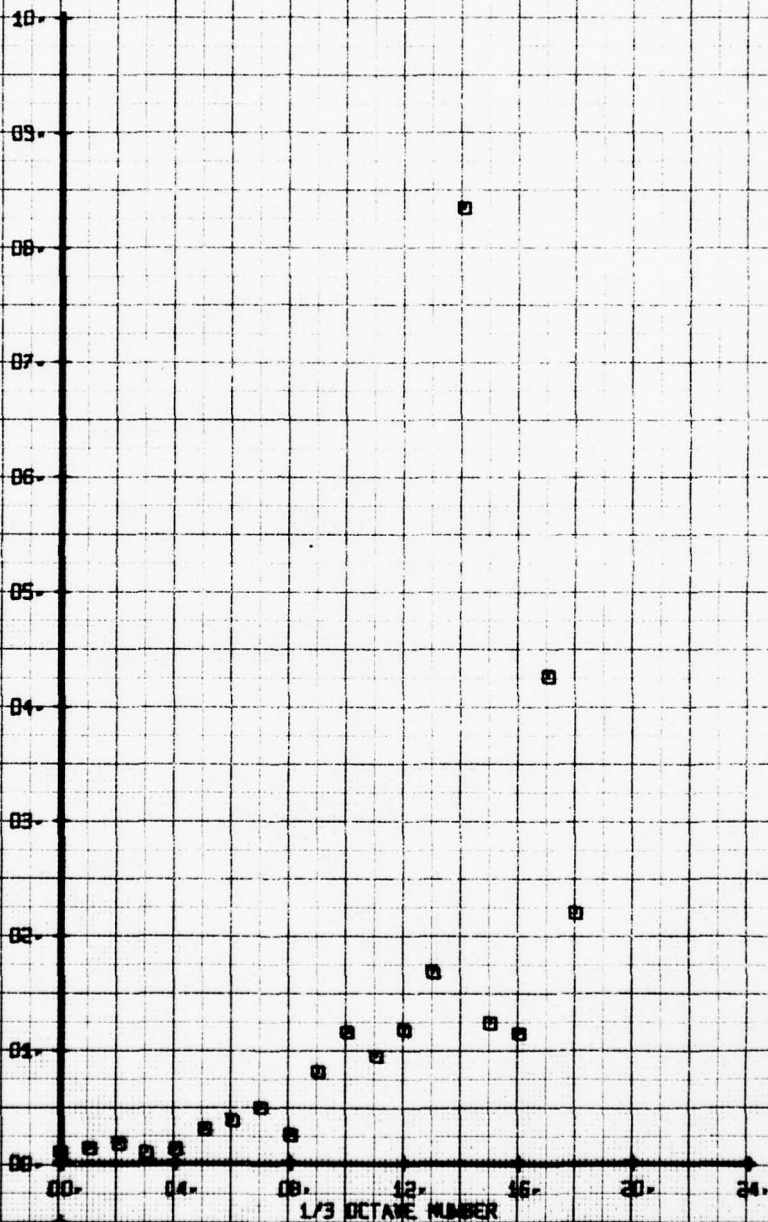
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 ATR E. CT. W/C SHRD. W. LTP 150PST  
 RUN 185 TP 5

SYM  
 □

CH  
 86

LEGEND  
 PARAMETER  
 V-ALPHA

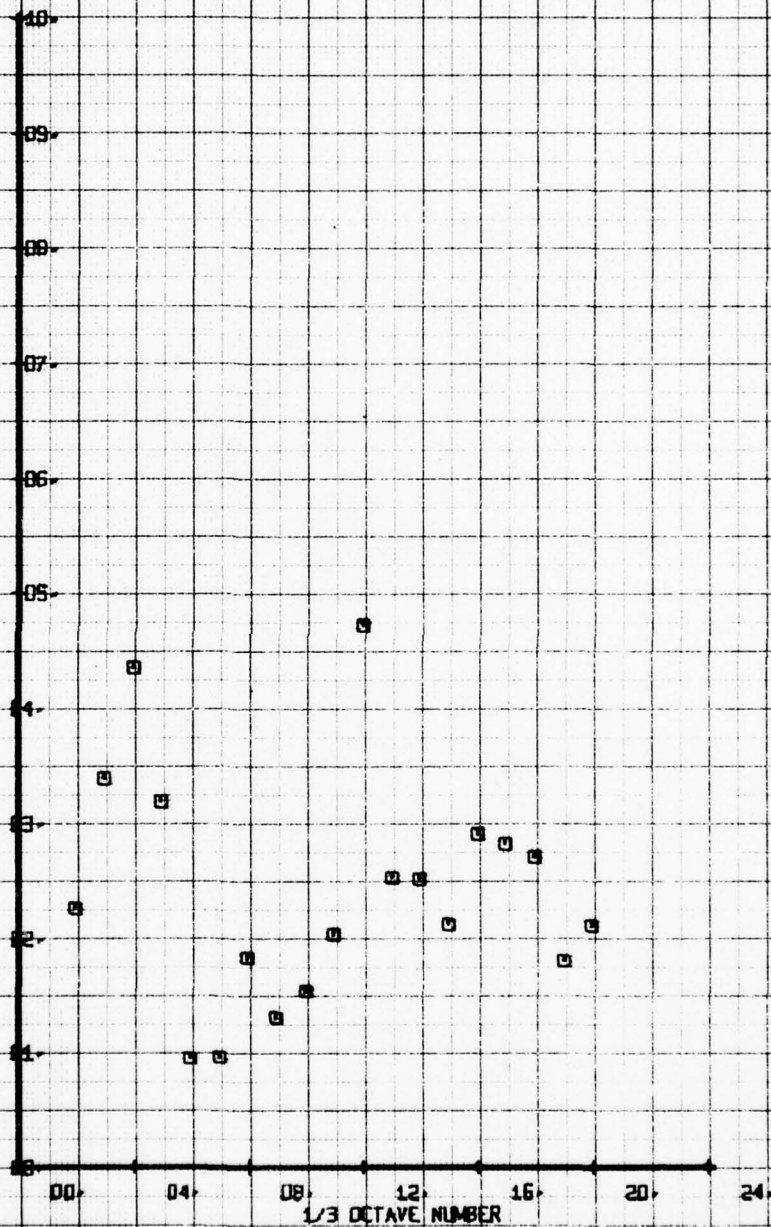
X-Y VELOCITY COMPONENT V-ALPHA FPS



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHAD. W. LTP 150PSI  
 RUN 185 TP 2

SYN CH PARAMETER  
 05 V-BETA

X-2 VELOCITY COMPONENT V-BETA FFS



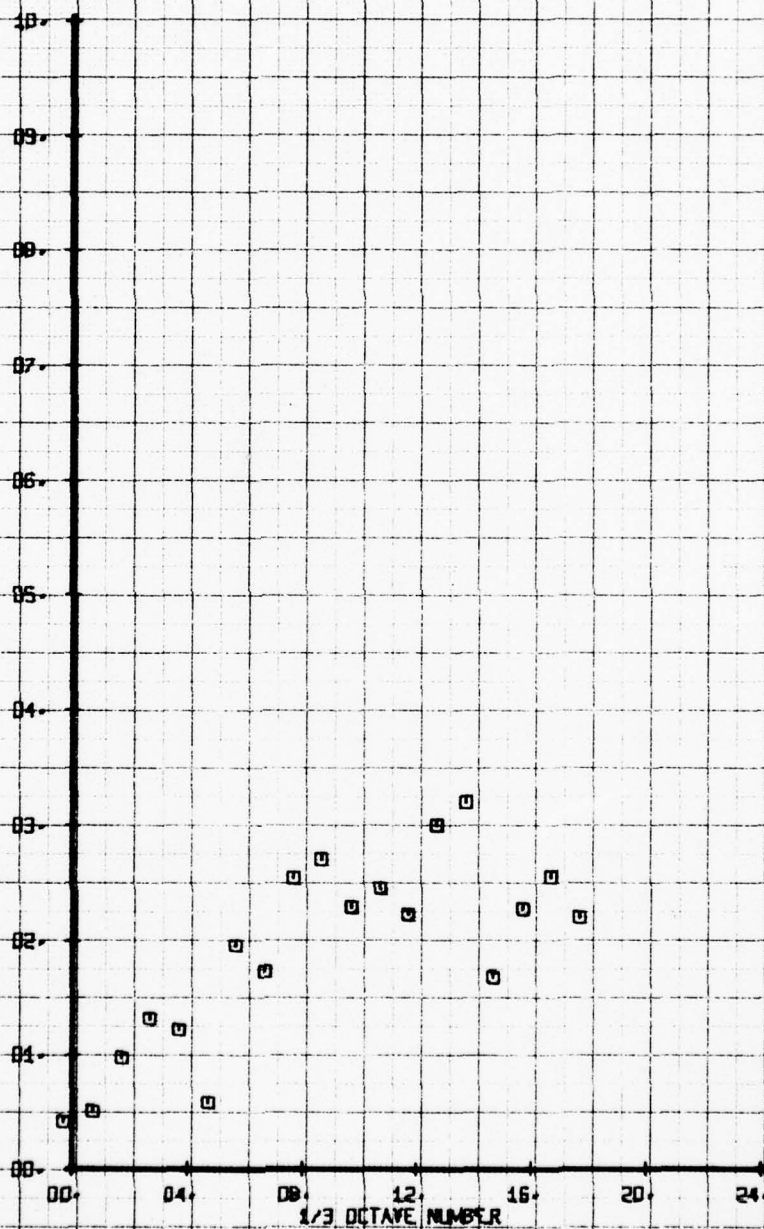
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W/C SHRO. W. LTP 150PSI  
 RUN 185 TP 3

SYM  
 O

CH  
 65

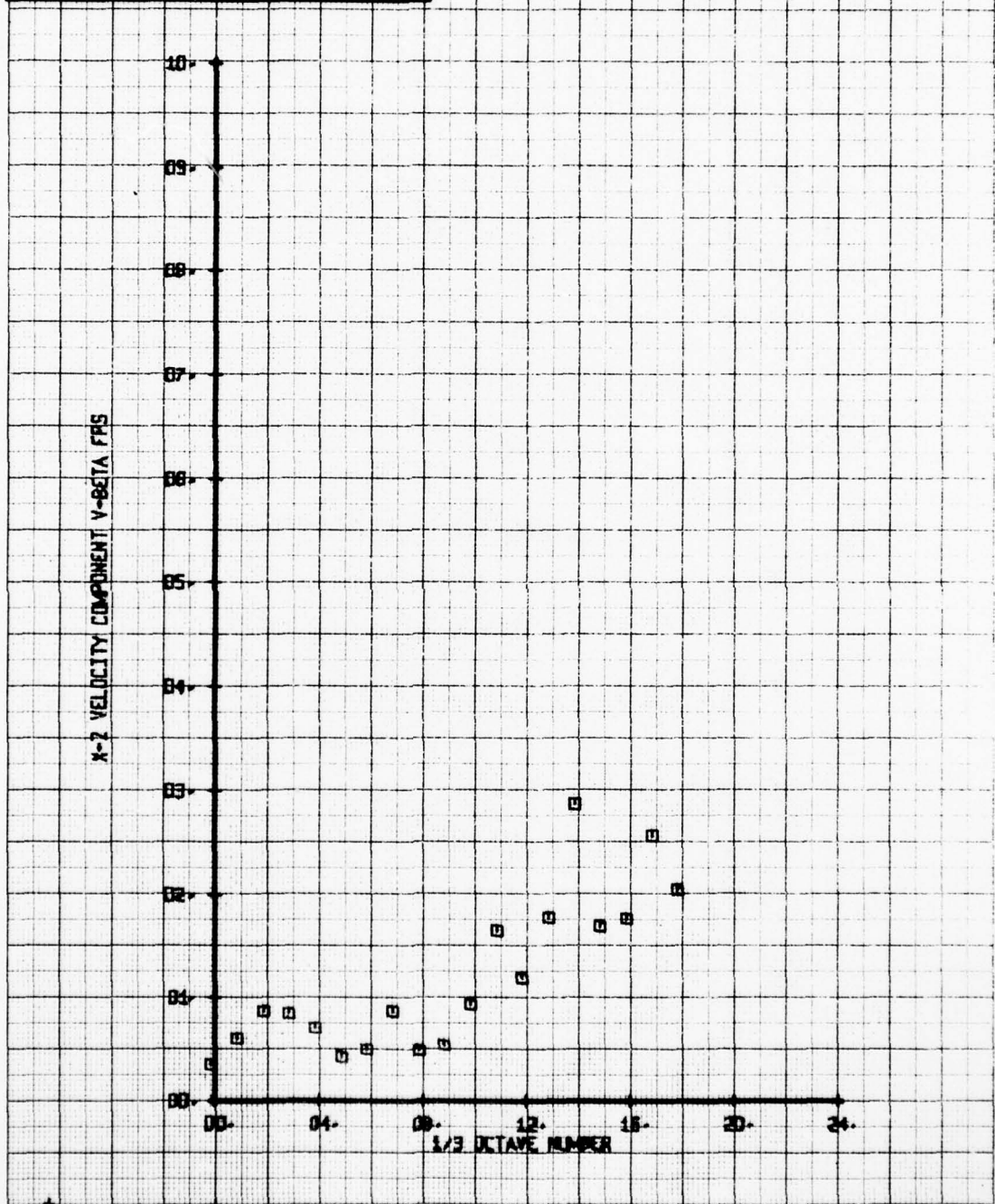
LEGEND  
 PARAMETER  
 V-BETA

X-Z VELOCITY COMPONENT V-BETA FPS



NOF FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. V. LTP 150PSI  
 RUN 185 TP 4

SYN CH  
 0 65  
 LEGEND  
 PARAMETER  
 V-BETA

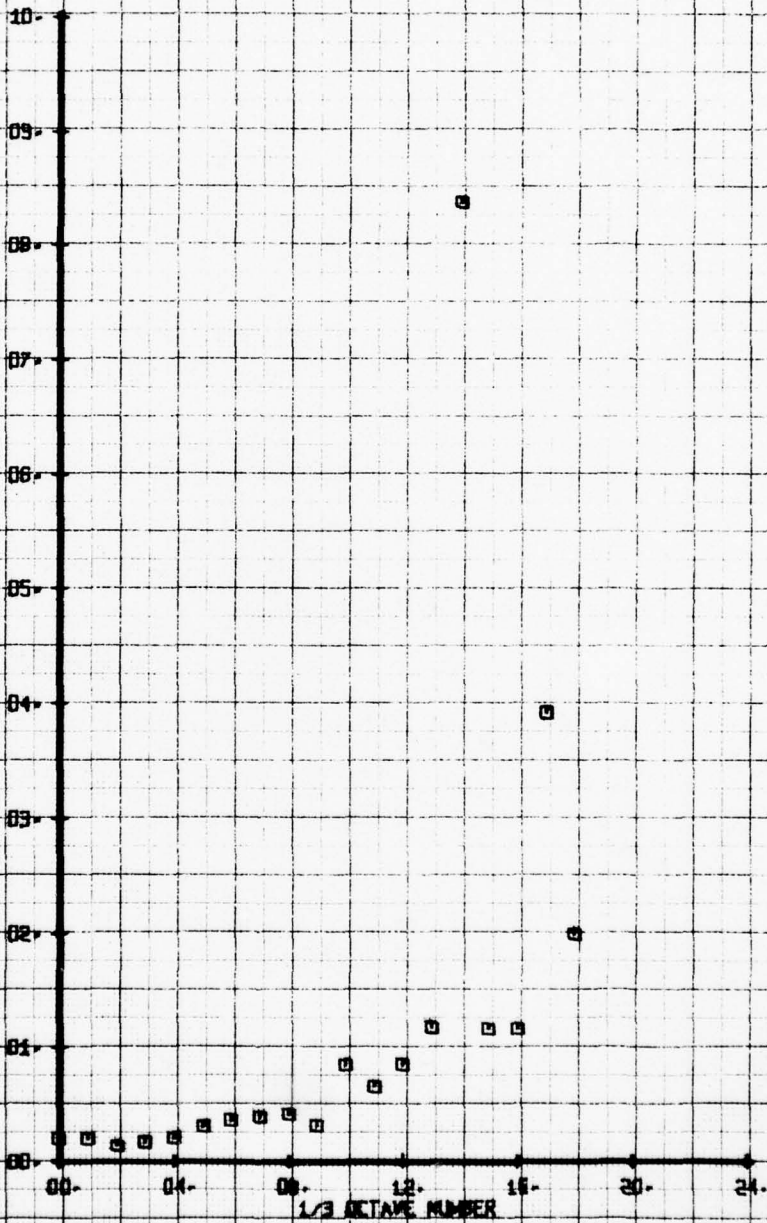




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. W. LIP 150PSI  
 RUN 195 TP 5

SYN CH  
 0 65  
 LEGEND  
 PARAMETER  
 V-BETA

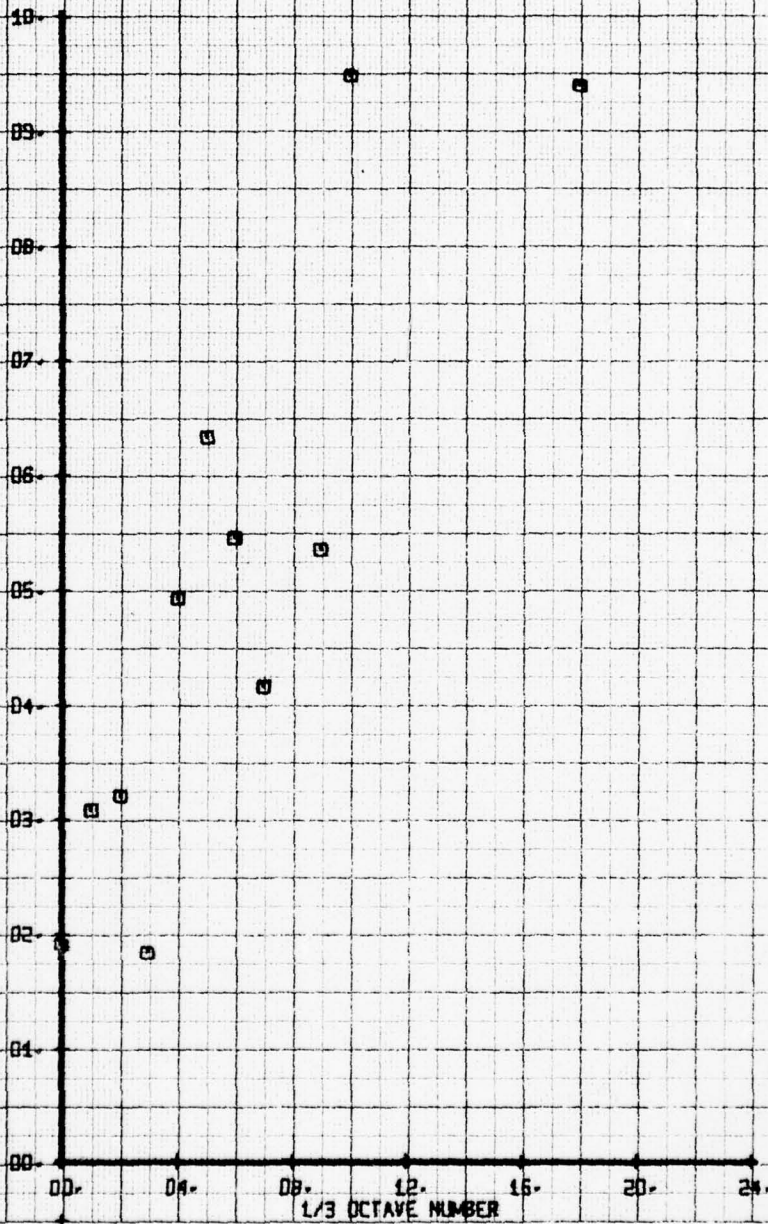
X-2 VELOCITY COMPONENT V-BETA FPS



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 ATR E CT. W/C SHRO. CONTR PAR. 150P  
 RUN 187 TP 2

LEGEND  
 SYM CH PARAMETER  
 @ 55 ALPHA

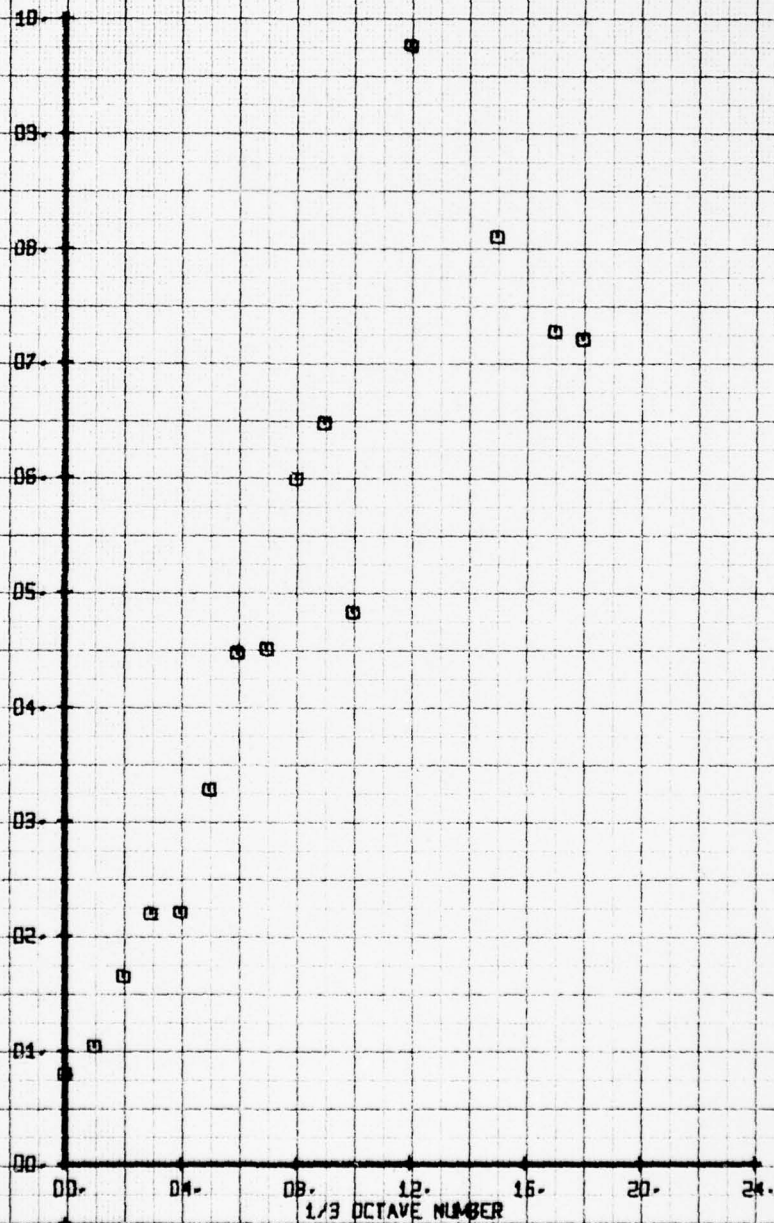
VERTICAL FLOW ANGLE, ALPHA - DEGREES



NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR. PAR. 150P  
 RUN 187 TP 3

LEGEND  
 SYM CH PARAMETER  
 □ 55 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES



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BOEING VERTOL CO PHILADELPHIA PA

F/G 1/3

INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONF--ETC(U)

SEP 78 P F SHERIDAN

DAAJ02-77-C-0020

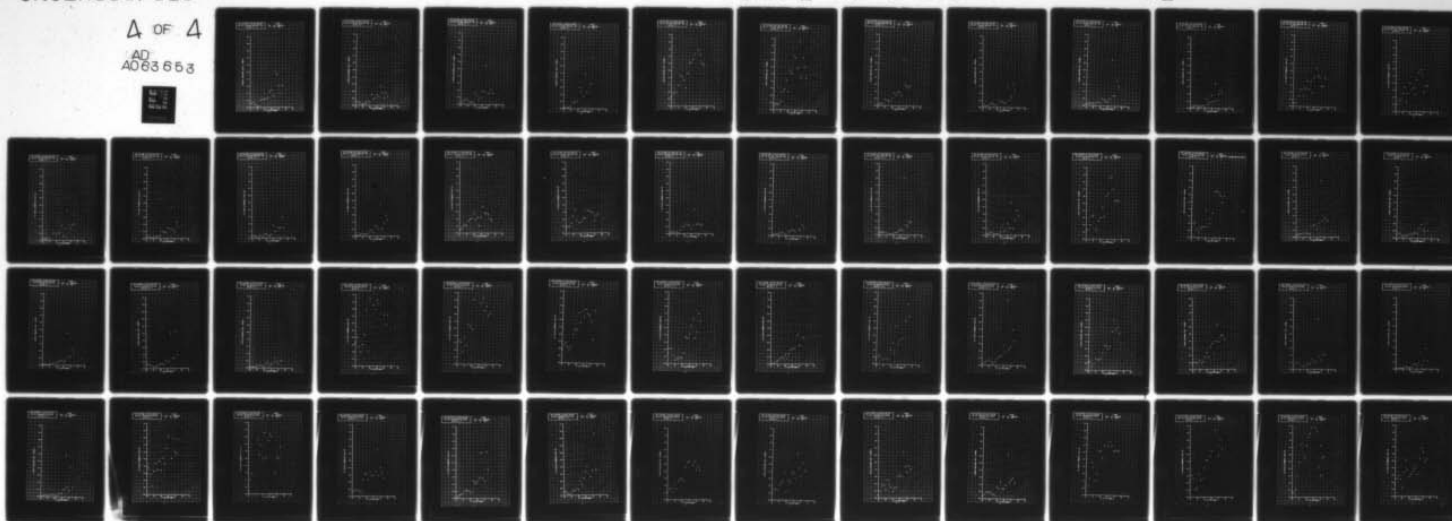
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A063 653



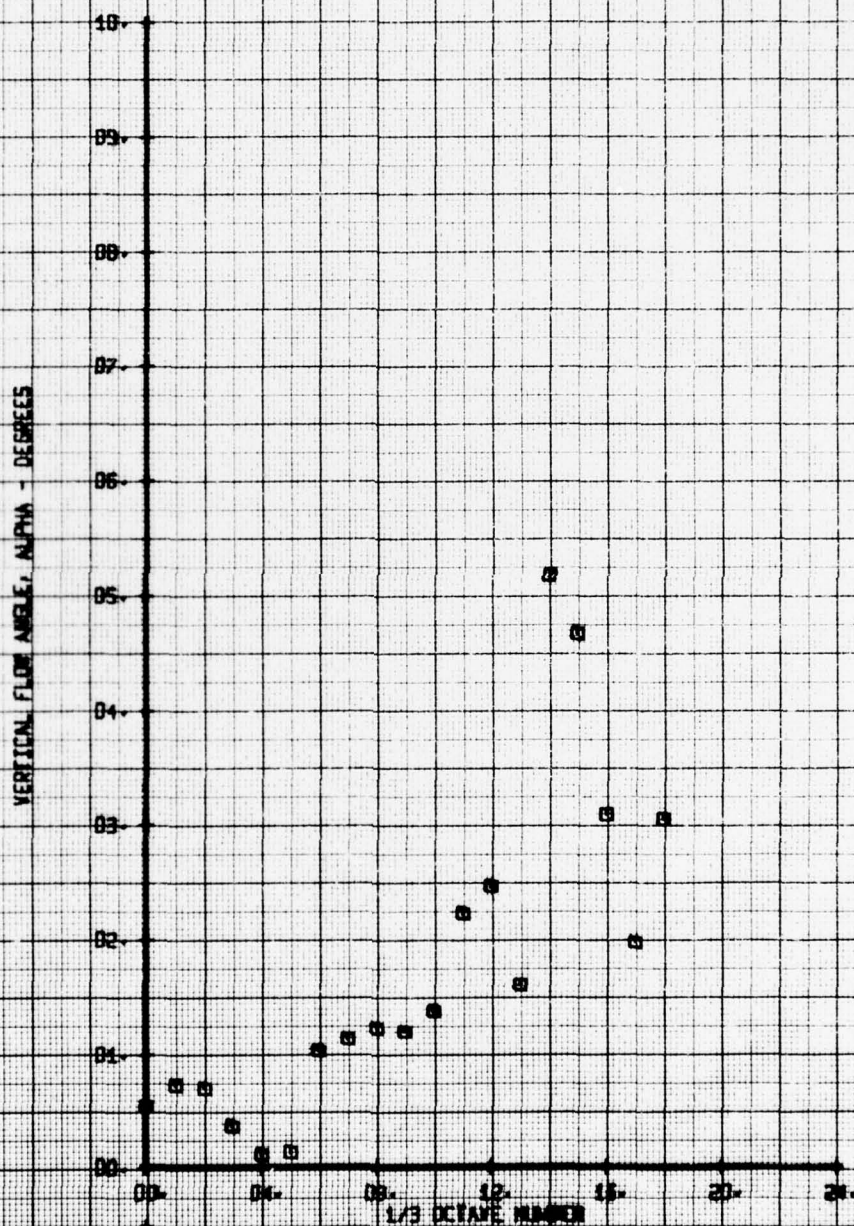
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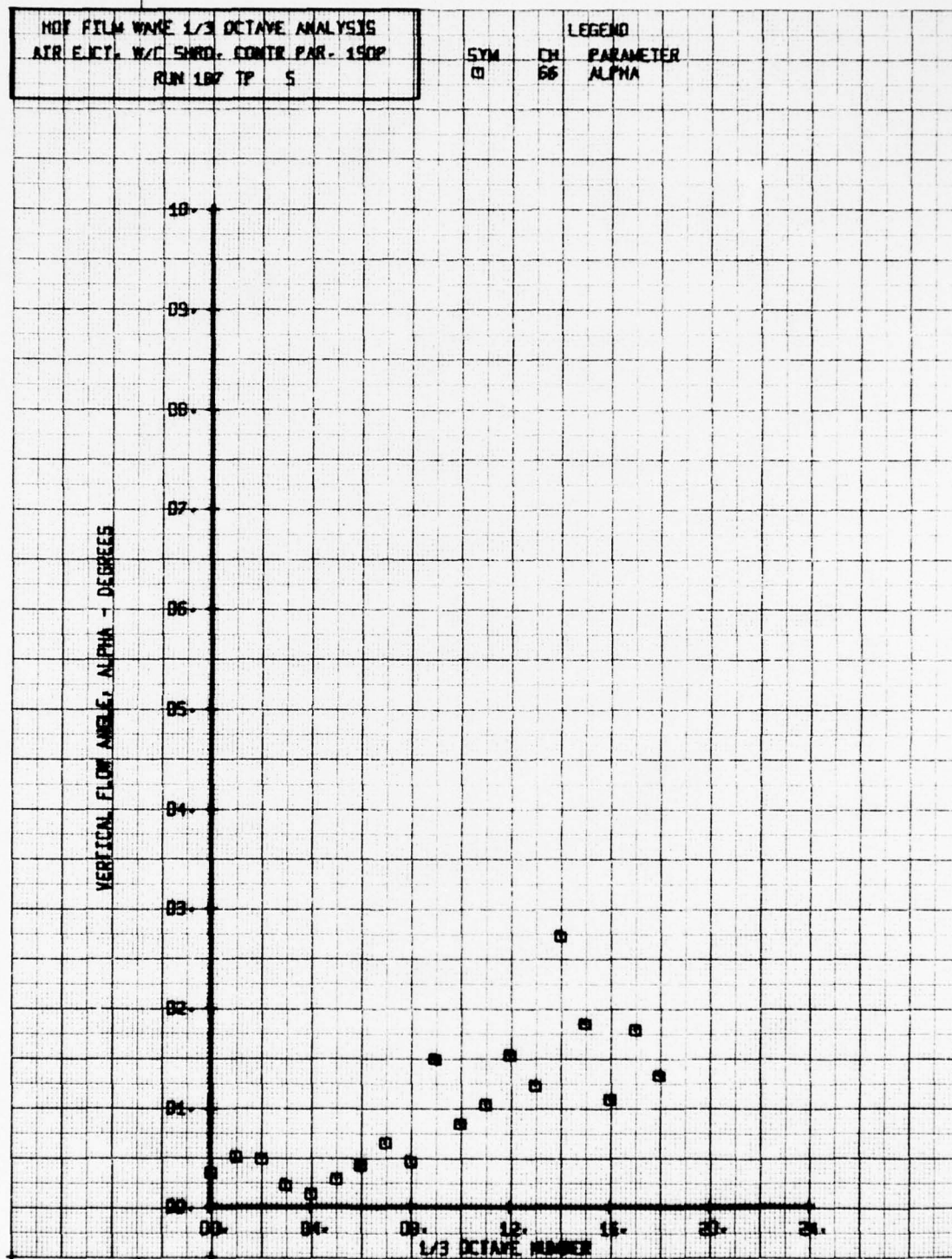
MOF FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W/C SHRO. CONTR PAR. 150P  
 RUN 187 TP 4

SYM	CH	PARAMETER
□	66	ALPHA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR E.C.T. W/C SHRO. CONTR. PAR. 150P  
 RUN 187 TP 5

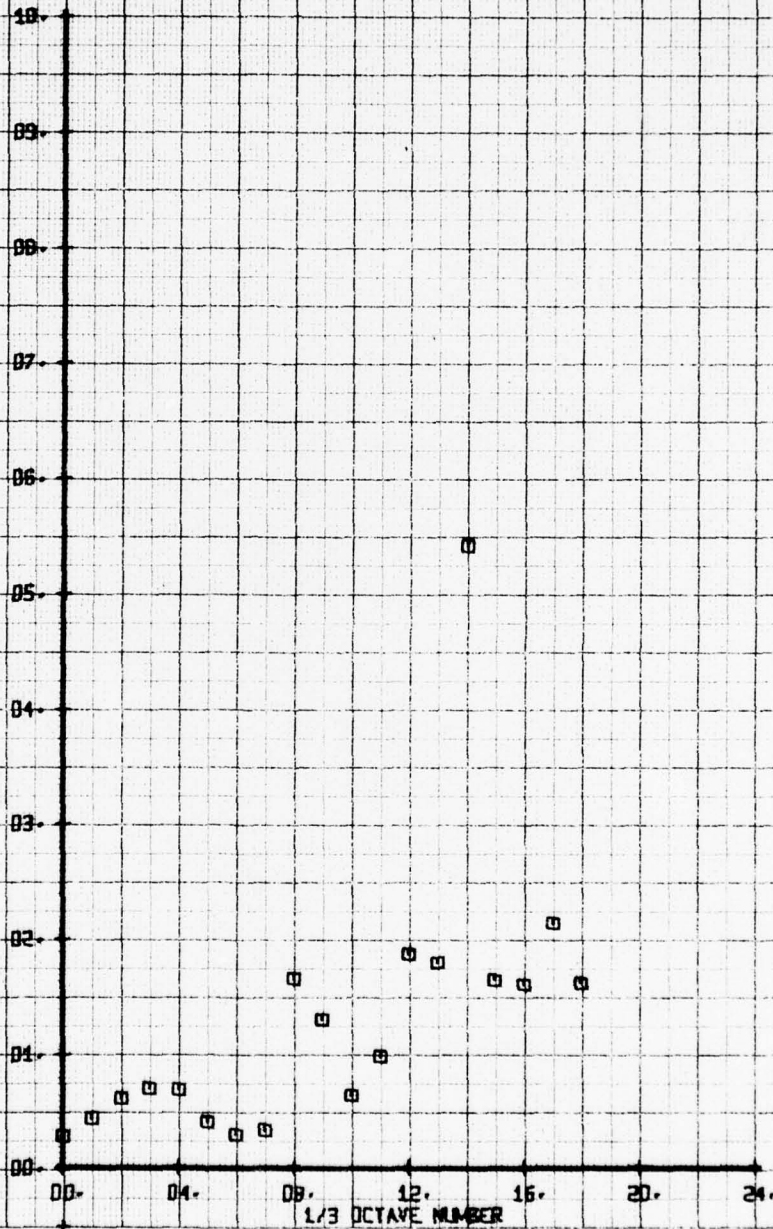
LEGEND	
SYM	CH
□	66
	PARAMETER
	ALPHA



MDI FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR F.C.T. W/C SHRO. CONTR PAN-150P  
 RUN 187 TP 6

LEGEND  
 SYN CH PARAMETER  
 0 66 ALPHA

VERTICAL FLOW ANGLE, ALPHA - DEGREES

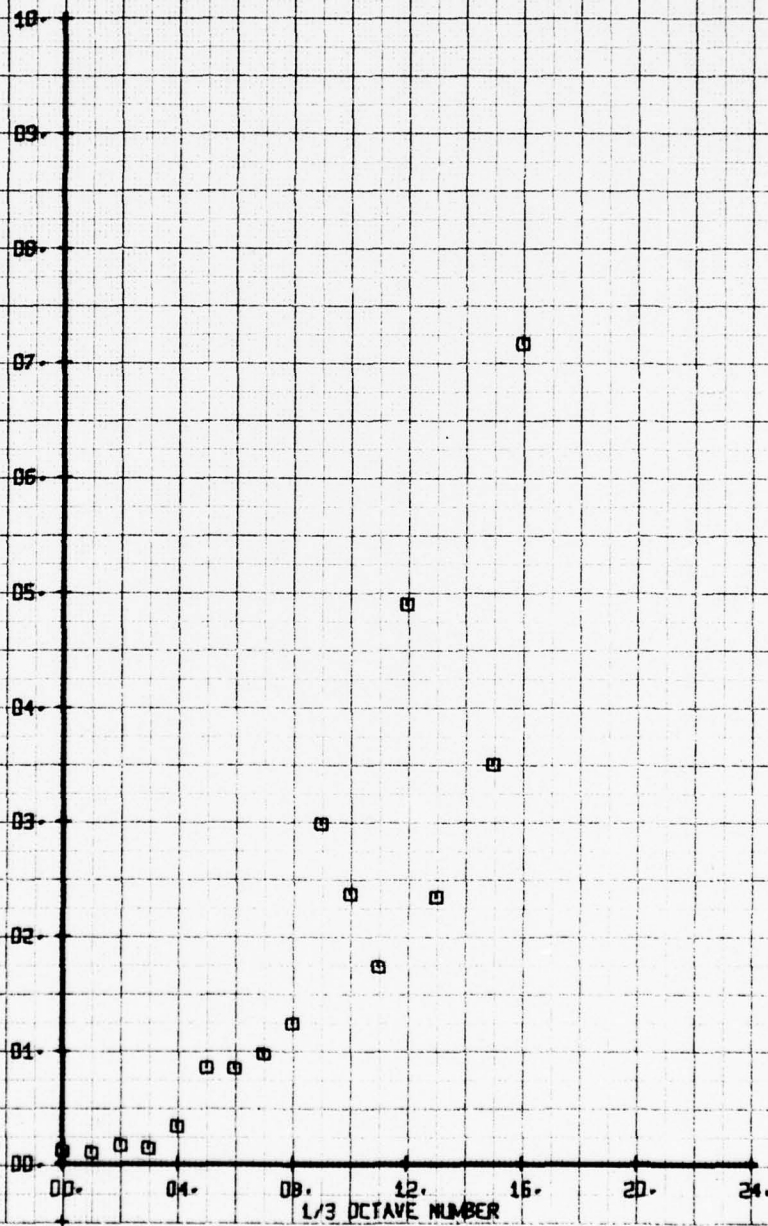




NOF FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR PAR. 150P  
 RUN 187 TP 7

SYM	CH	PARAMETER
□	66	ALPHA

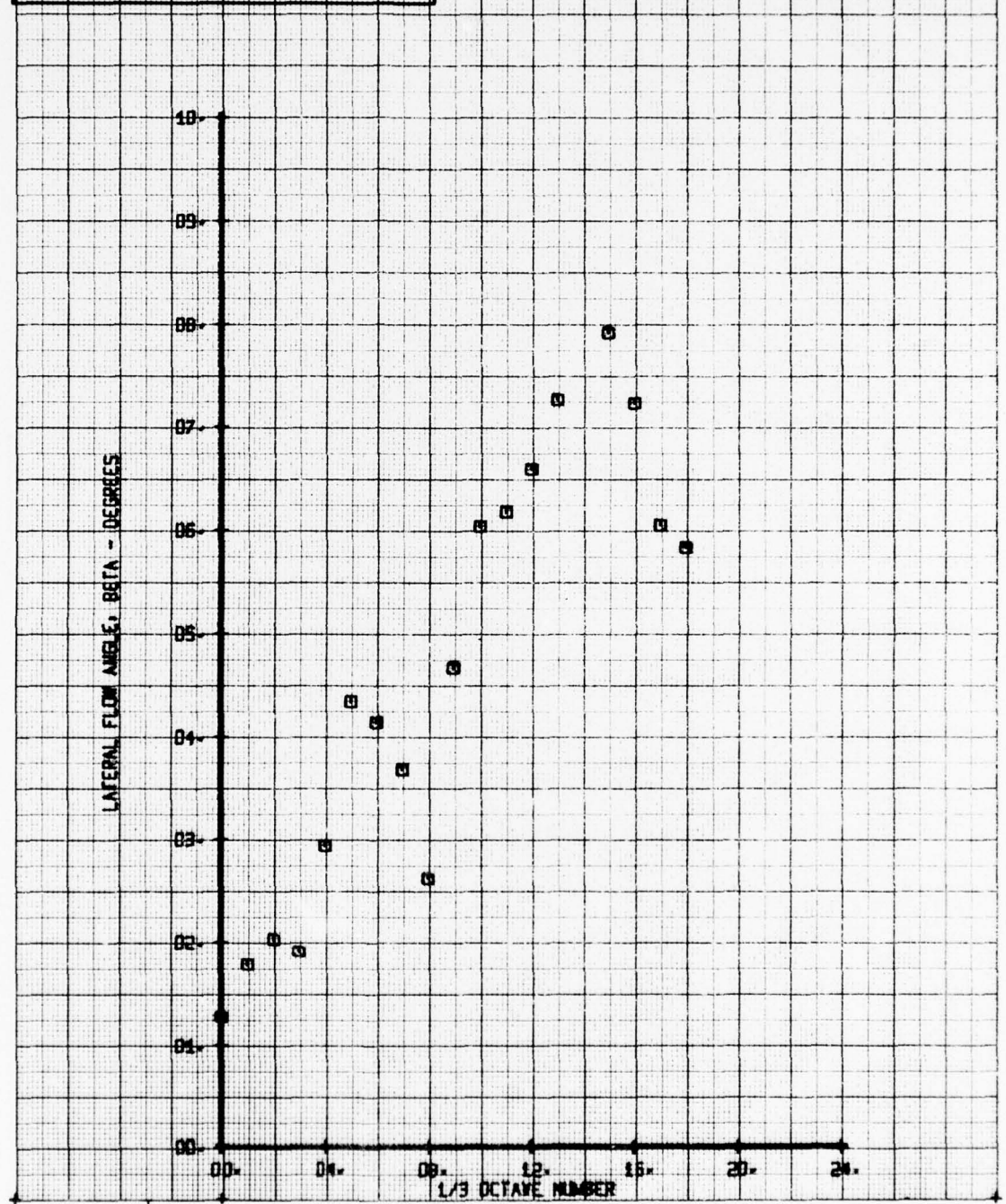
VERTICAL FLOW ANGLE, ALPHA - DEGREES





NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 ATR E.J.T. W/C SHRD. CONTR PAR. 150P  
 RUN 187 TP 2

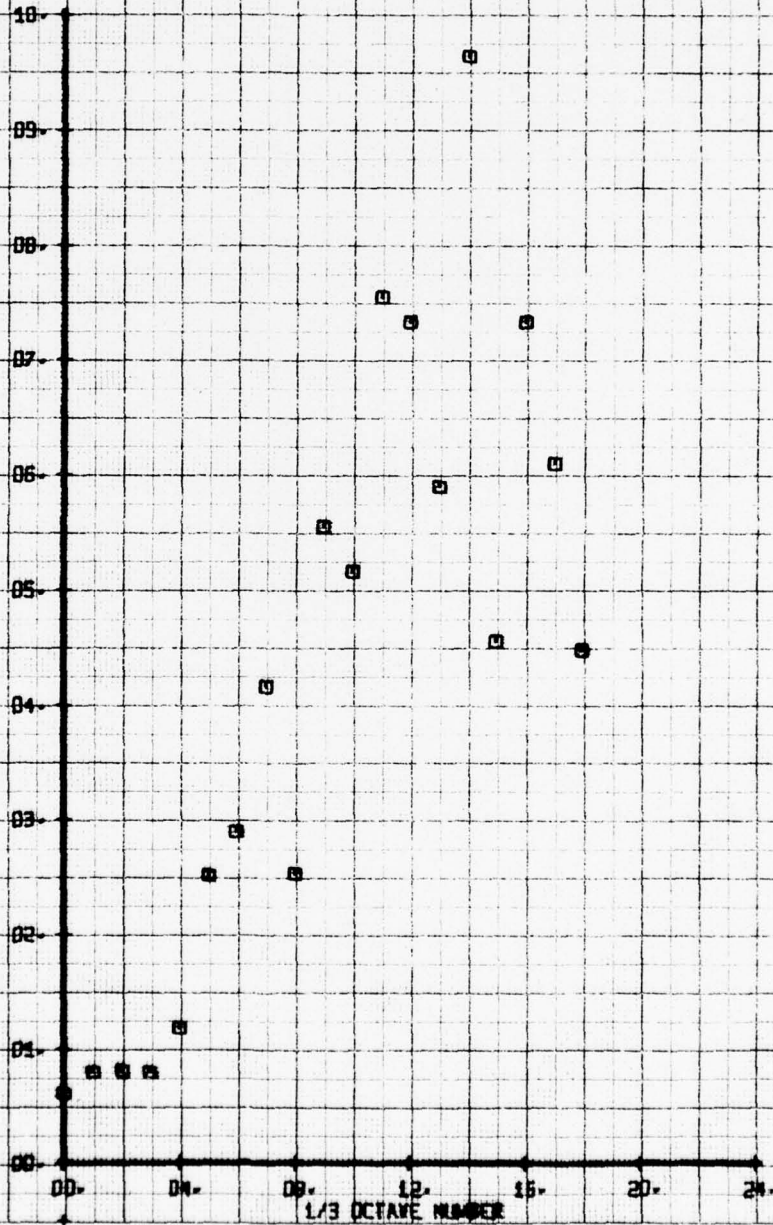
SYM	CH	LEGEND	PARAMETER
□	65		BETA



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR. PAR. 150P  
 RUN 107 TP 3

SYN CH  
 0 65  
 LEGEND  
 PARAMETER  
 BETA

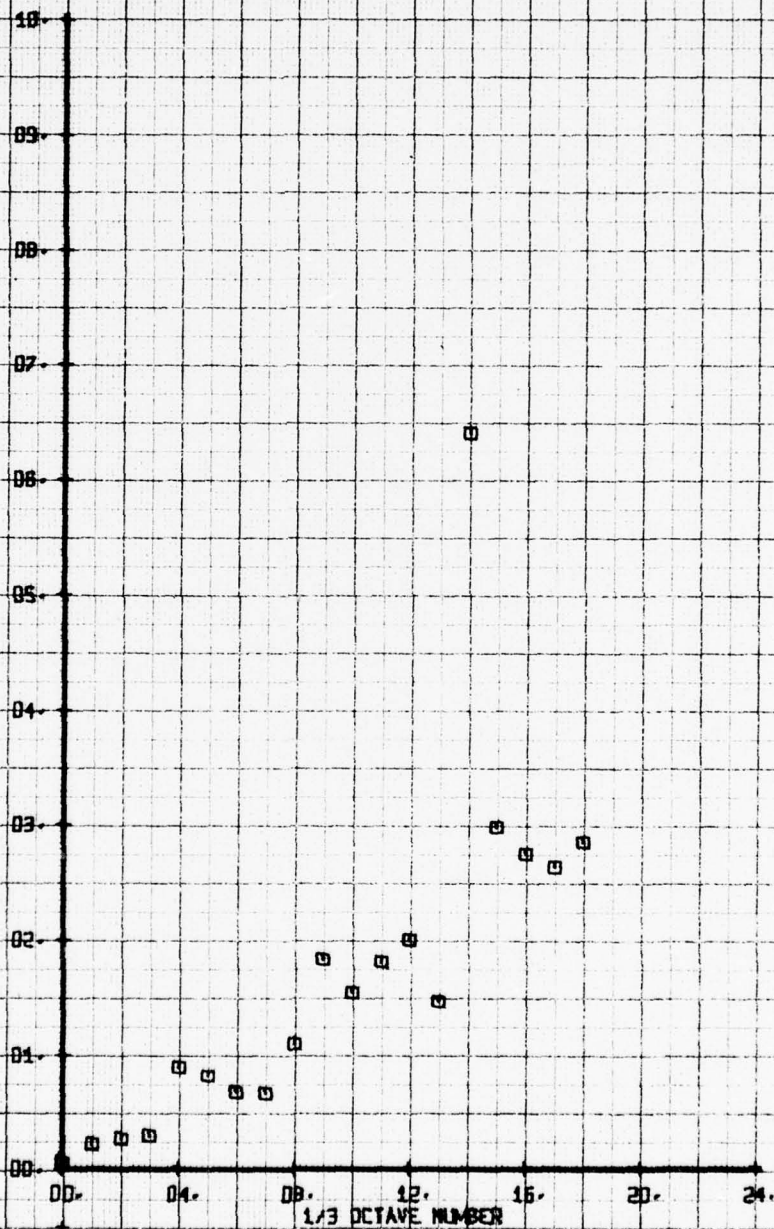
LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR E.C.T. W/C 5MRD. CENTER FAN - 150P  
 RUN 187 TP 4

SYM CH PARAMETER  
 00 05 BETA

LATERAL FLOW ANGLE, BETA - DEGREES

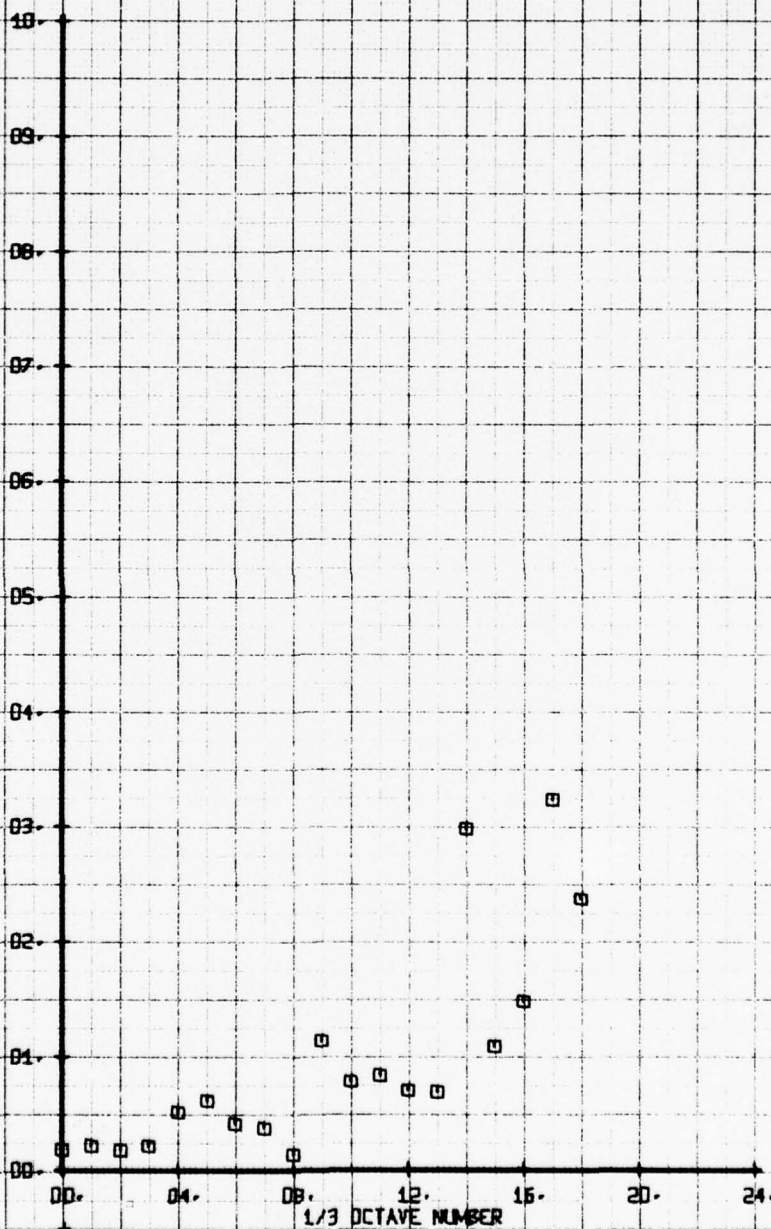




NOF FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SMOG. CONTR PAR. 150P  
 RUN 187 TP 5

LEGEND		
SYM	CH	PARAMETER
□	65	BETA

LATERAL FLOW ANGLE, BETA - DEGREES

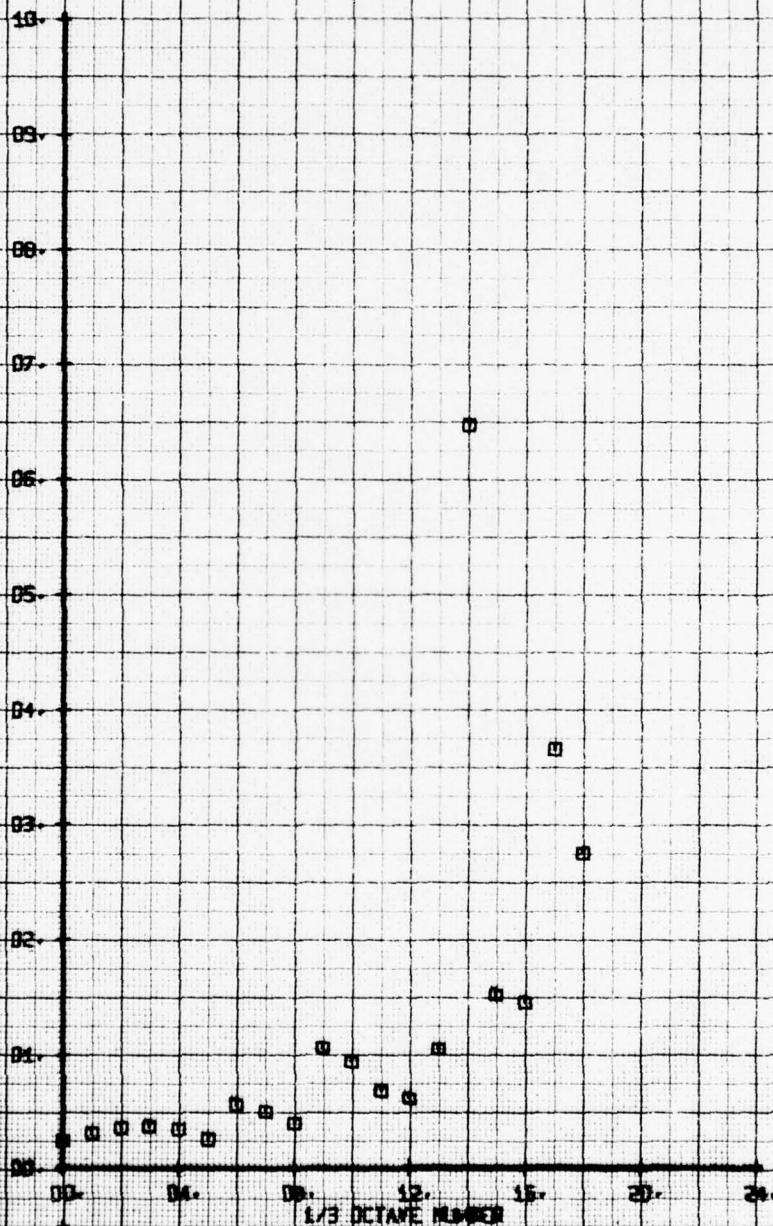




HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR. PAR. 150P  
 RUN 187 TP 6

LEGEND  
 CH 65  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES

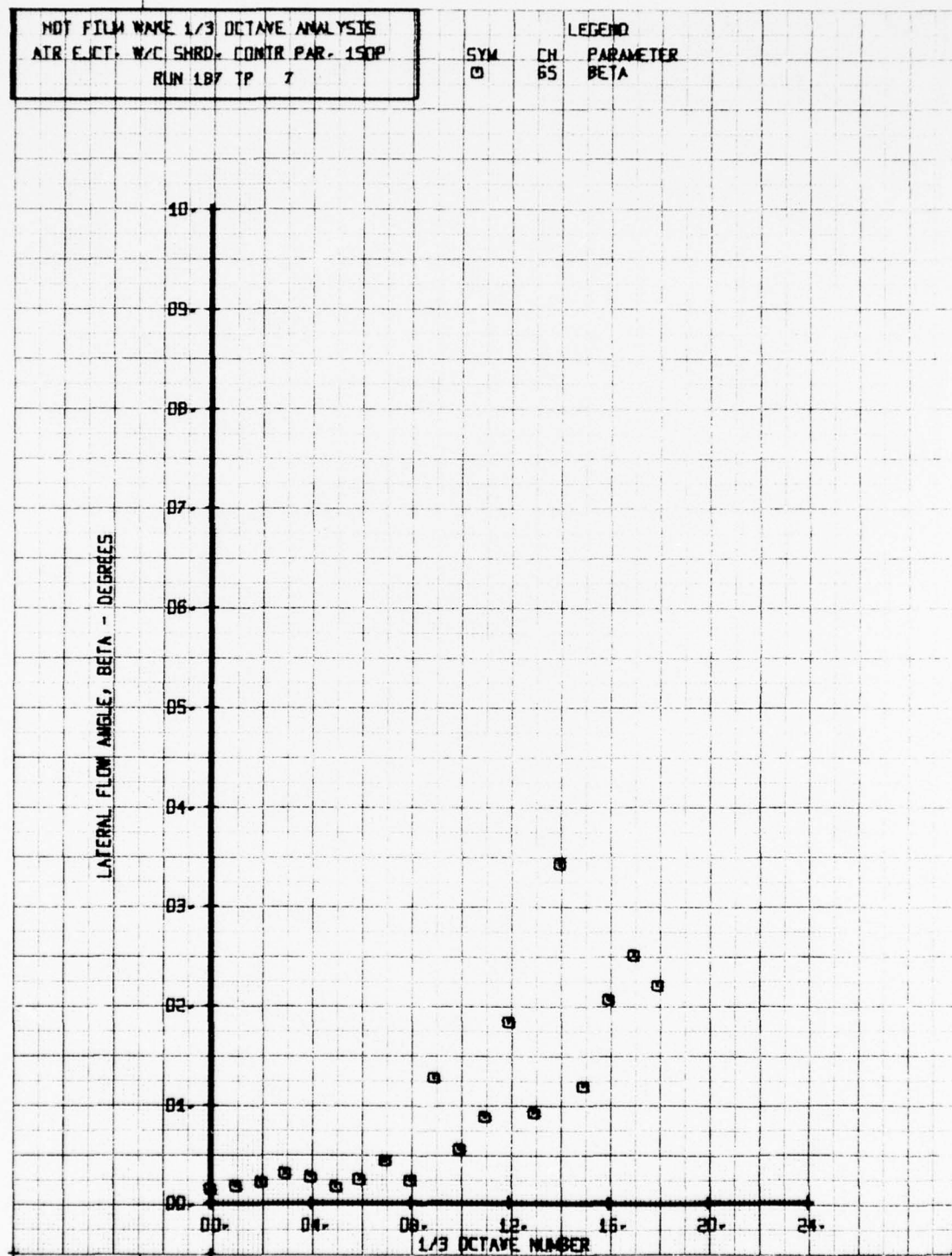


NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
AIR EJECT. W/C SHRD. CONTR. PAR. 150P  
RUN 197 TP 7

SYM  
□

CH  
65

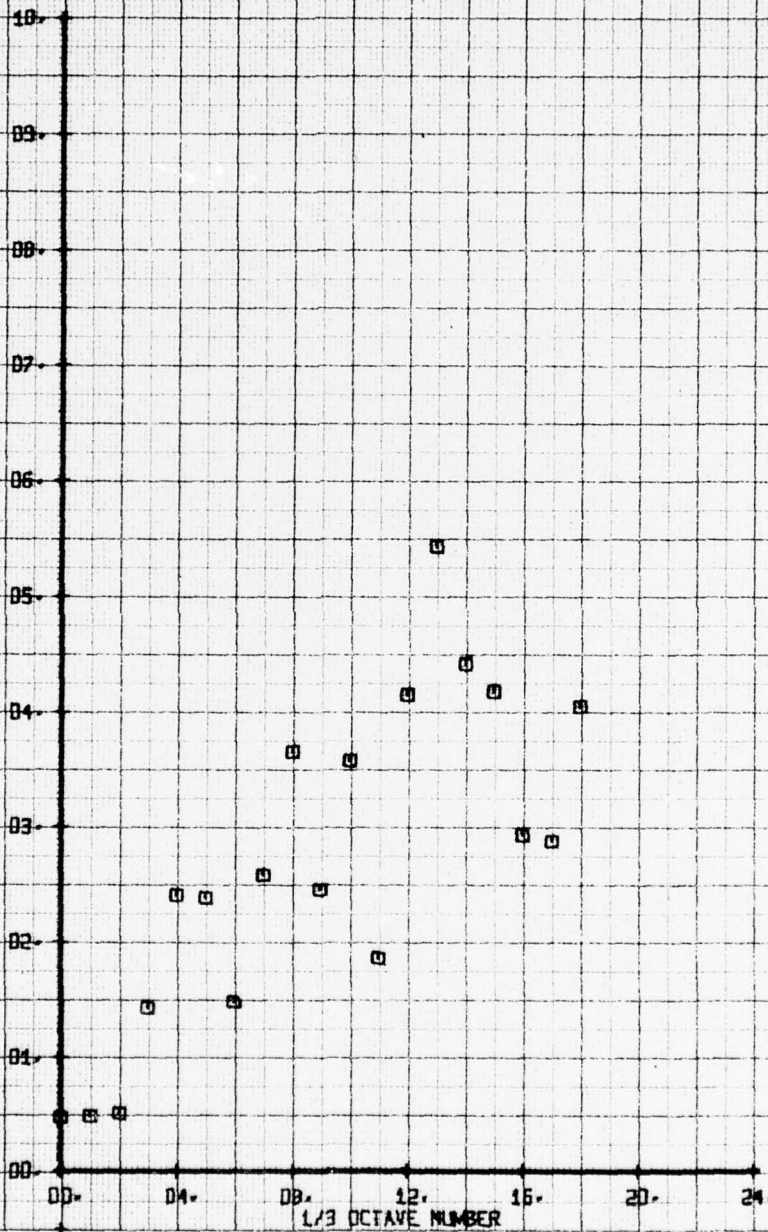
LEGEND  
PARAMETER  
BETA



NOISE FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR E.C.T. W/C SHRO. CENTER PAK. 150P  
 RUN 187 TP 2

LEGEND  
 SYM CH PARAMETER  
 □ 56 V-ALPHA

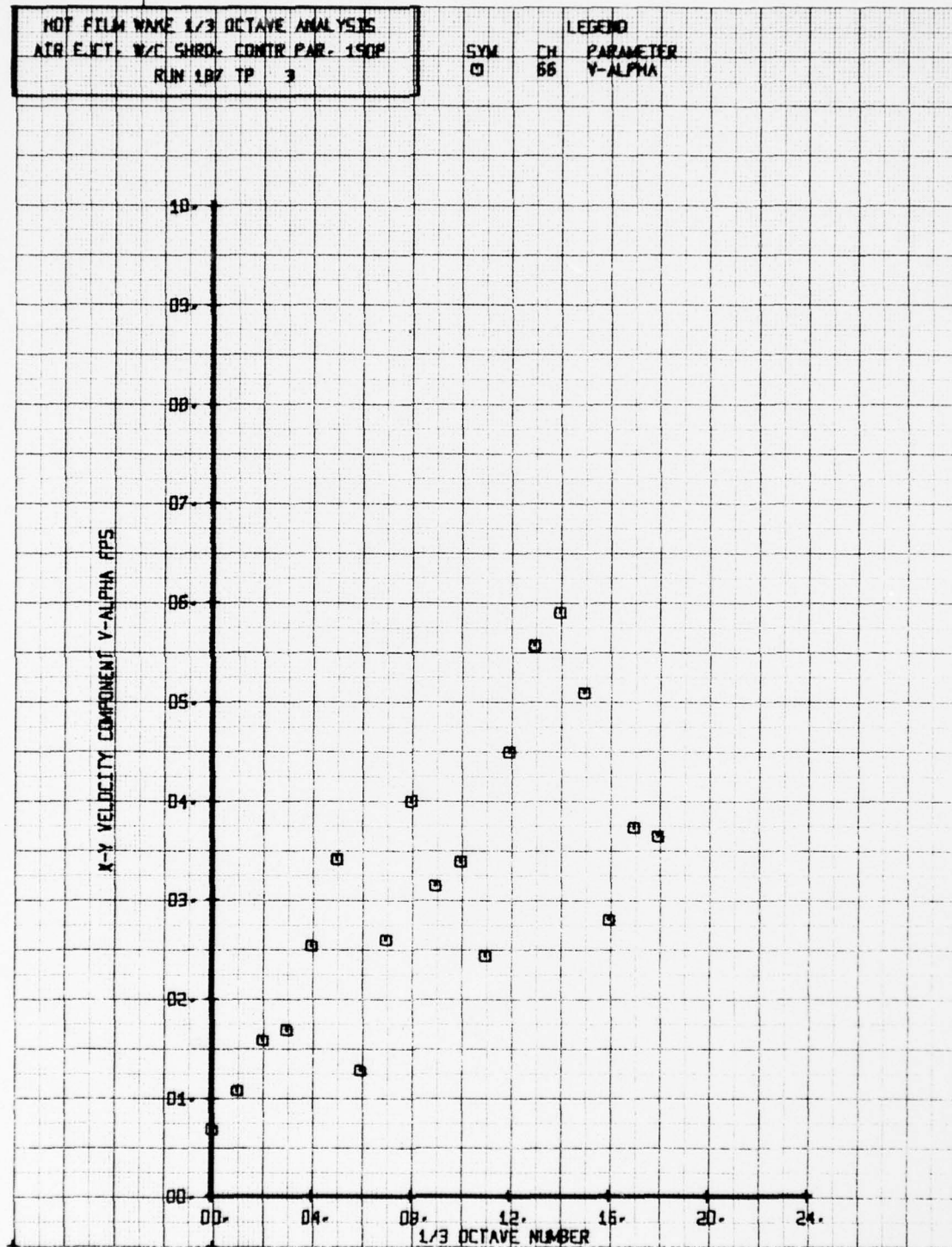
X-Y VELOCITY COMPONENT V-ALPHA FPS





NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR PAR. 150P  
 RUN 187 TP 3

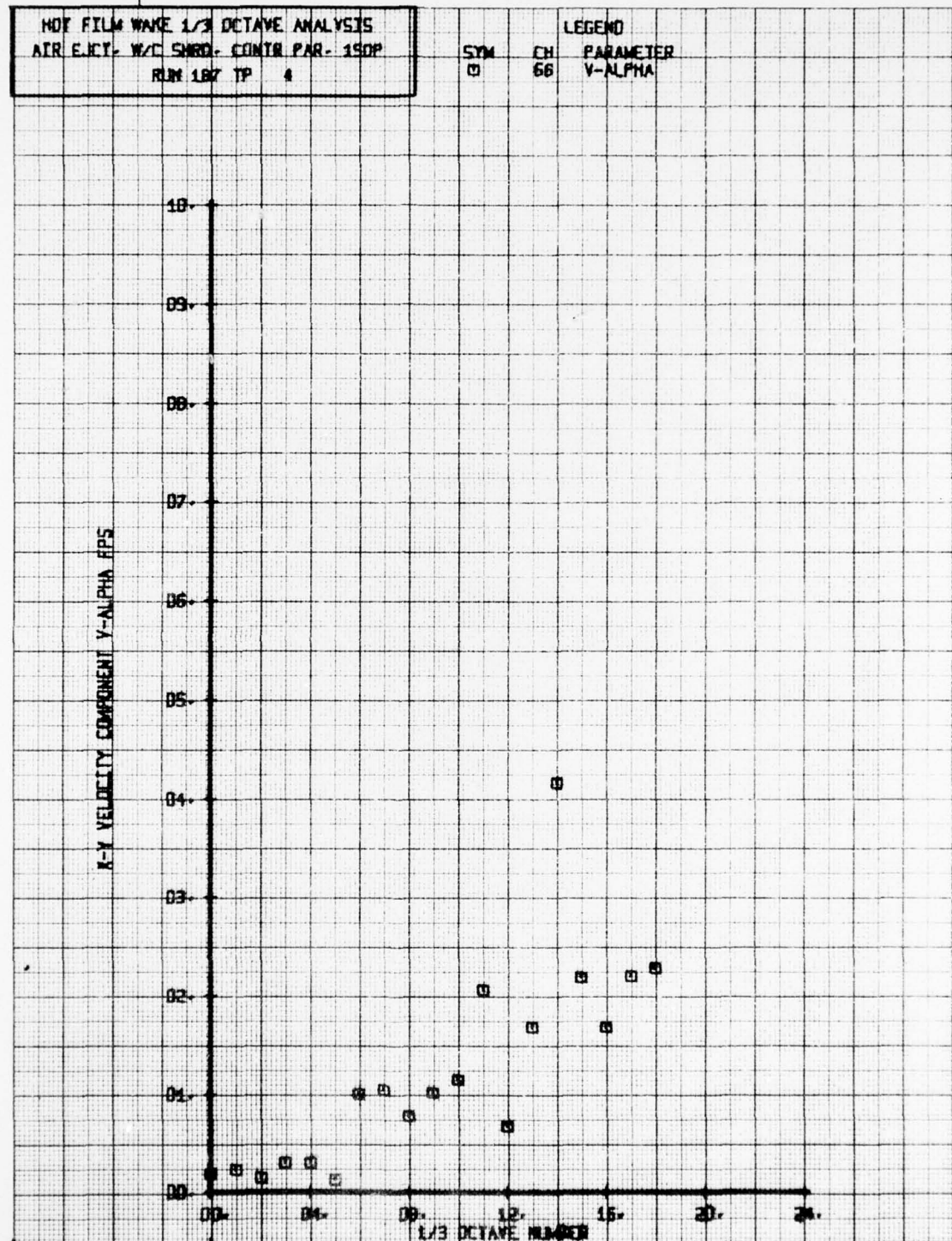
SYN CH  
 0 55  
 LEGEND  
 PARAMETER  
 V-ALPHA





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR PAR- 150P  
 RUN 187 TP 4

LEGEND  
 SYM CH PARAMETER  
 □ 66 V-ALPHA

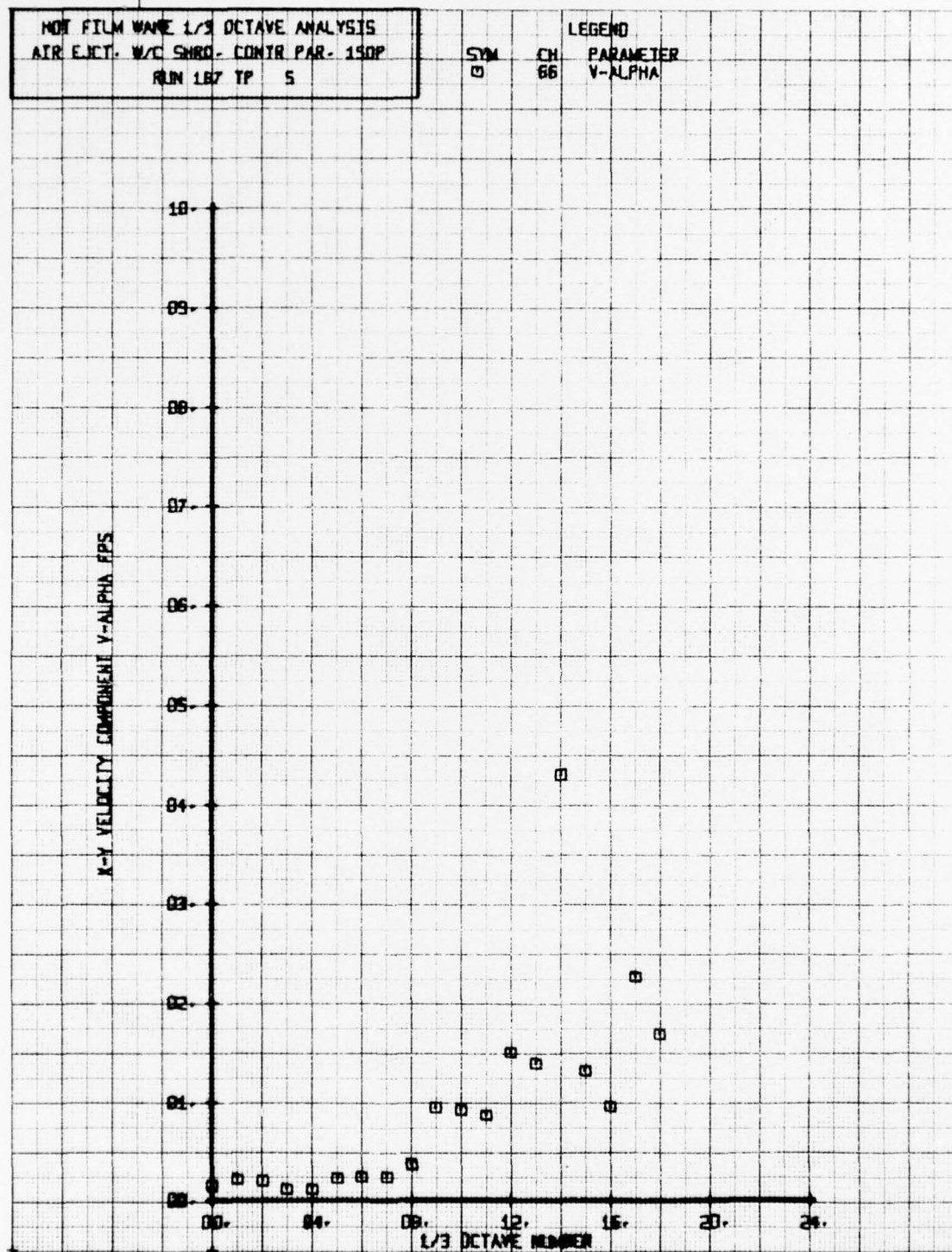


NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR PAR. 150P  
 RUN 187 TP 5

SYM  
 □

CH  
 66

LEGEND  
 PARAMETER  
 V-ALPHA

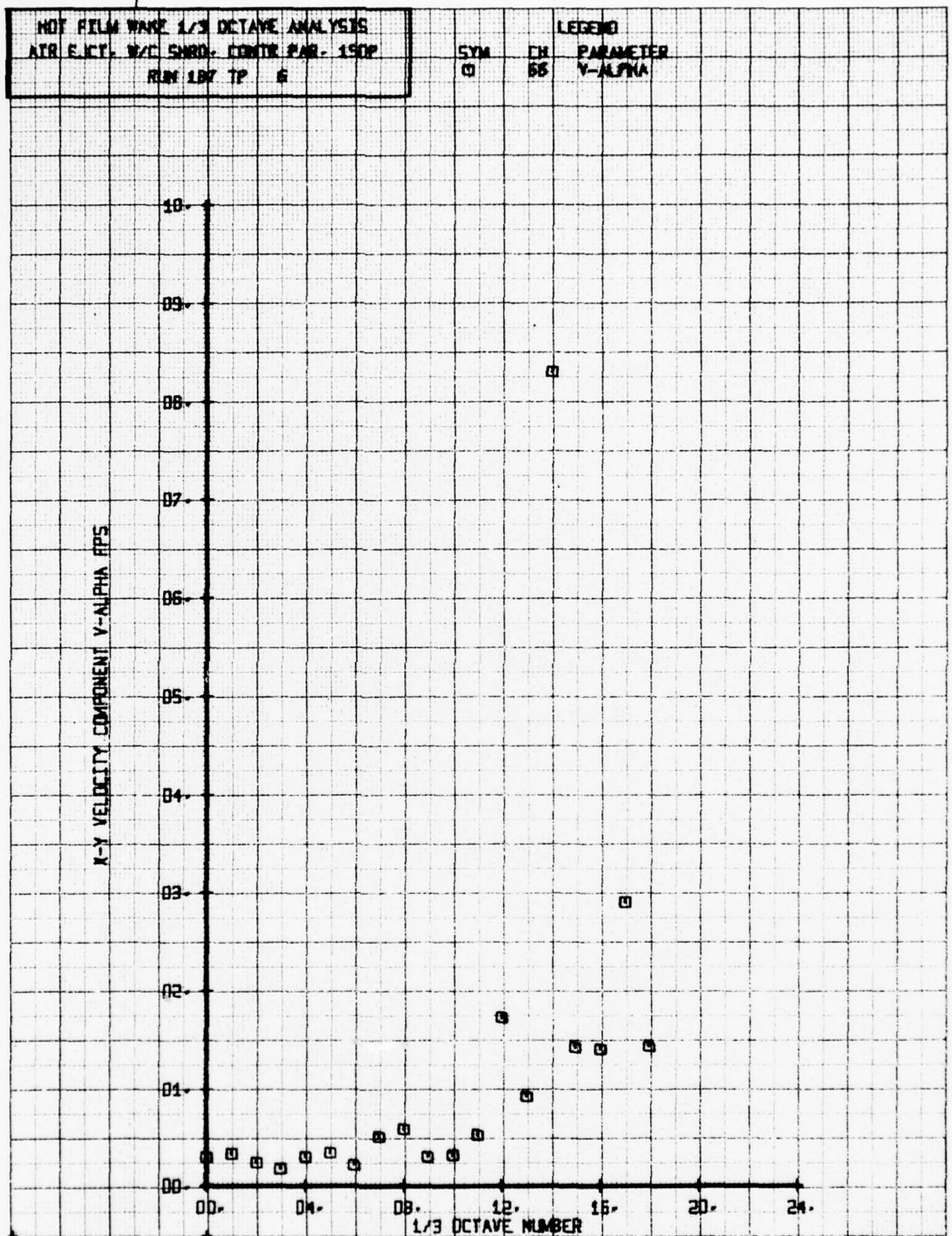


NOF FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR E.I.T. W/C SHRO. CONTR PAR. 190P  
 RUN 187 TP 6

SYM  
 0

CH  
 66

LEGEND  
 PARAMETER  
 Y-ALPHA

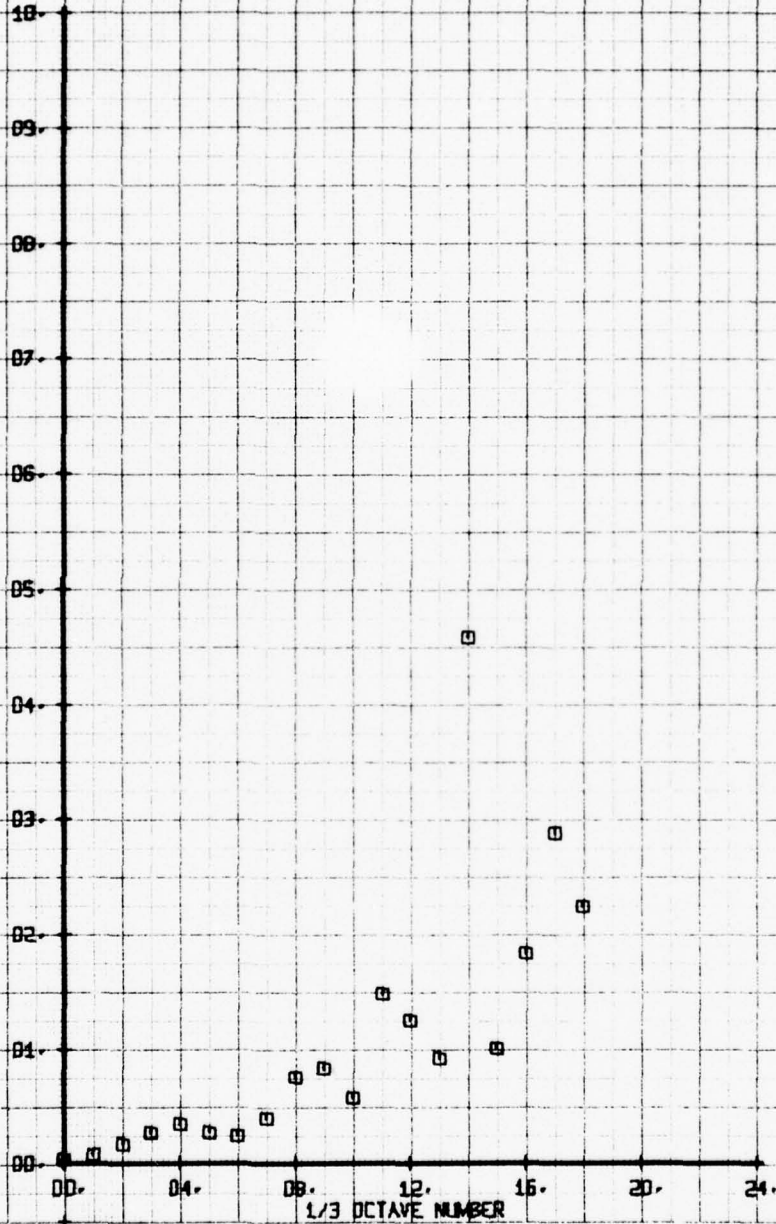




NOF FILM WAVE 1/3 OCTAVE ANALYSIS  
 ATR E.JCT. W/C SHRO. CONTR PAR. 150P  
 RUN 107 TP 7

LEGEND  
 SYM CH PARAMETER  
 □ 66 V-ALPHA

X-Y VELOCITY COMPONENT V-ALPHA FPS





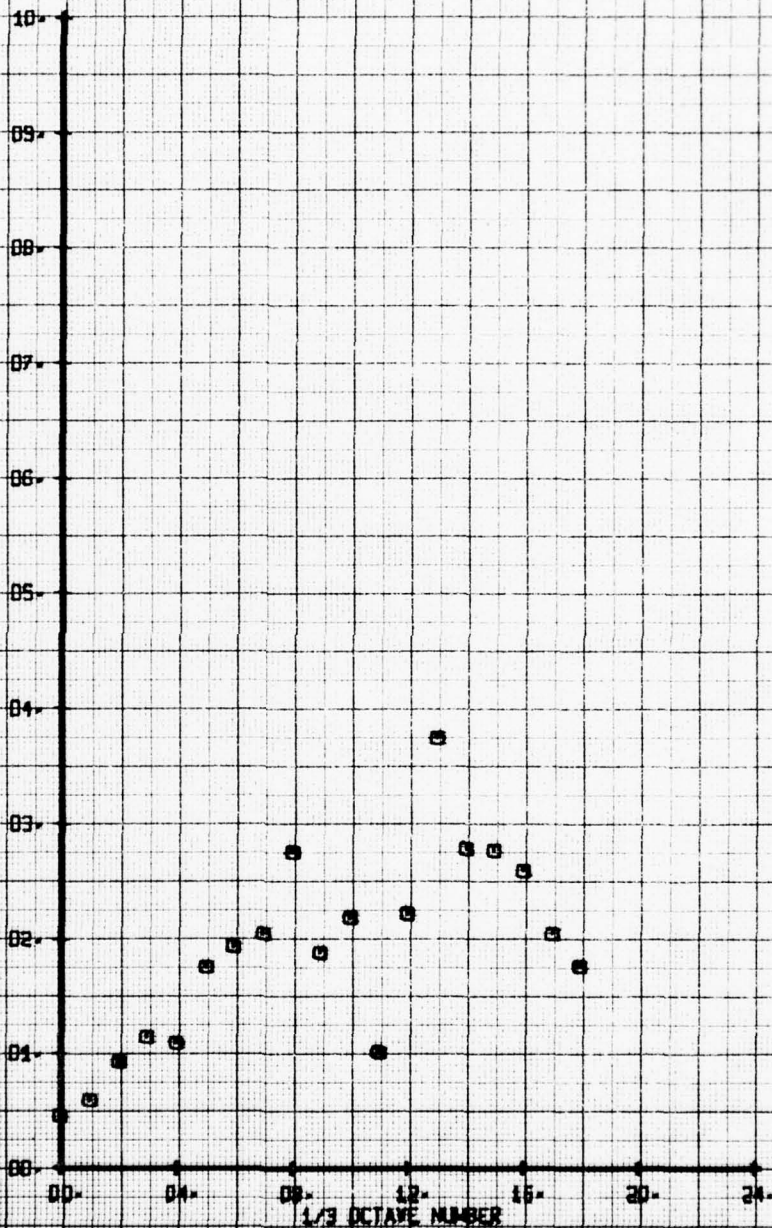
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 ATR E.JCT. W/C SHRD. CONTR PAR. 150P  
 RUN 187 TP 2

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



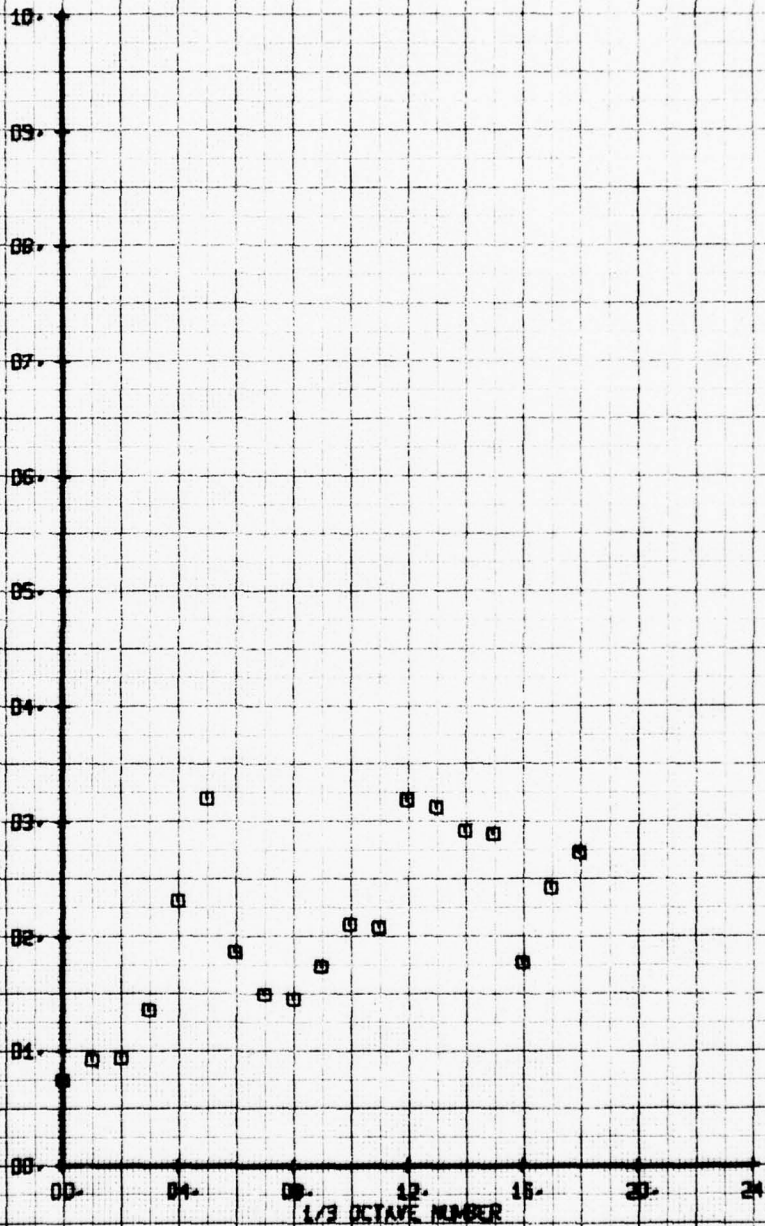
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/O SHRO. CONTR. PAR. 150P  
 RUN 187 TP 3

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

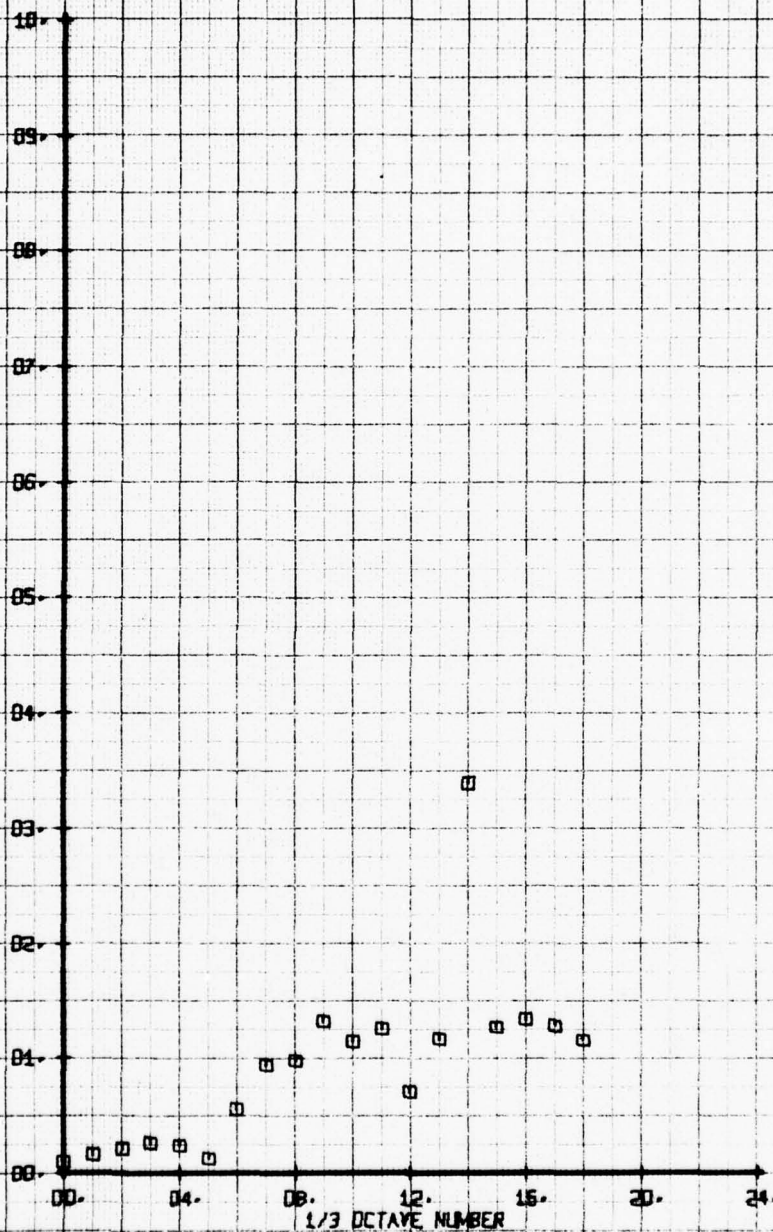
X-2 VELOCITY COMPONENT V-BETA FPS



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR ECT. W/C SHRO. CONTR PAR. 150P  
 RUN 187 IP 4

LEGEND	
SYM	CH
□	65
	PARAMETER
	V-BETA

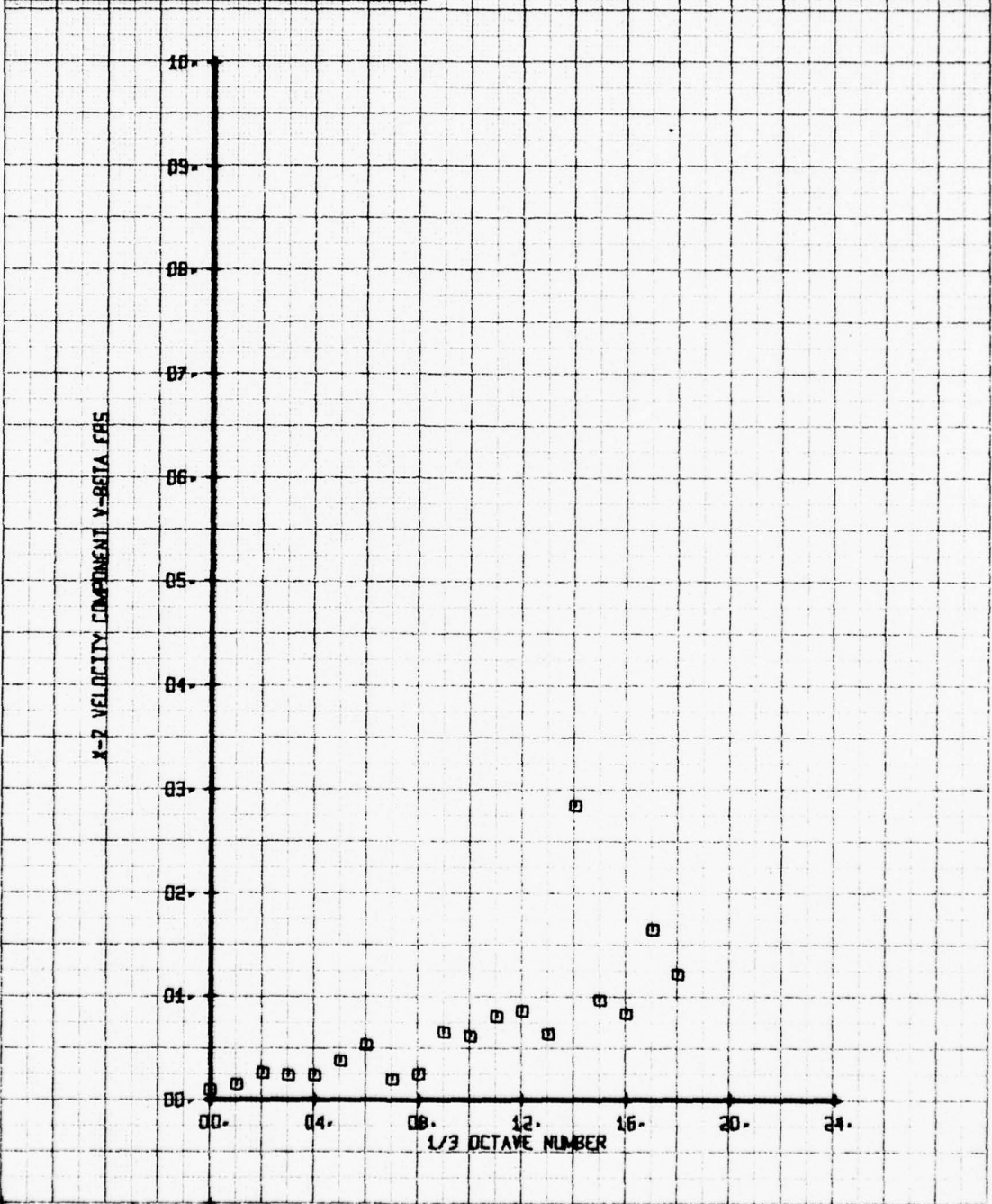
X-Z VELOCITY COMPONENT V-BETA FBS





HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 ATR E.JT. W/C SHRO. CONTR PAR. 150P  
 RUN 187 TP 5

LEGEND	
SYM	CH
□	65
PARAMETER	
V-BETA	

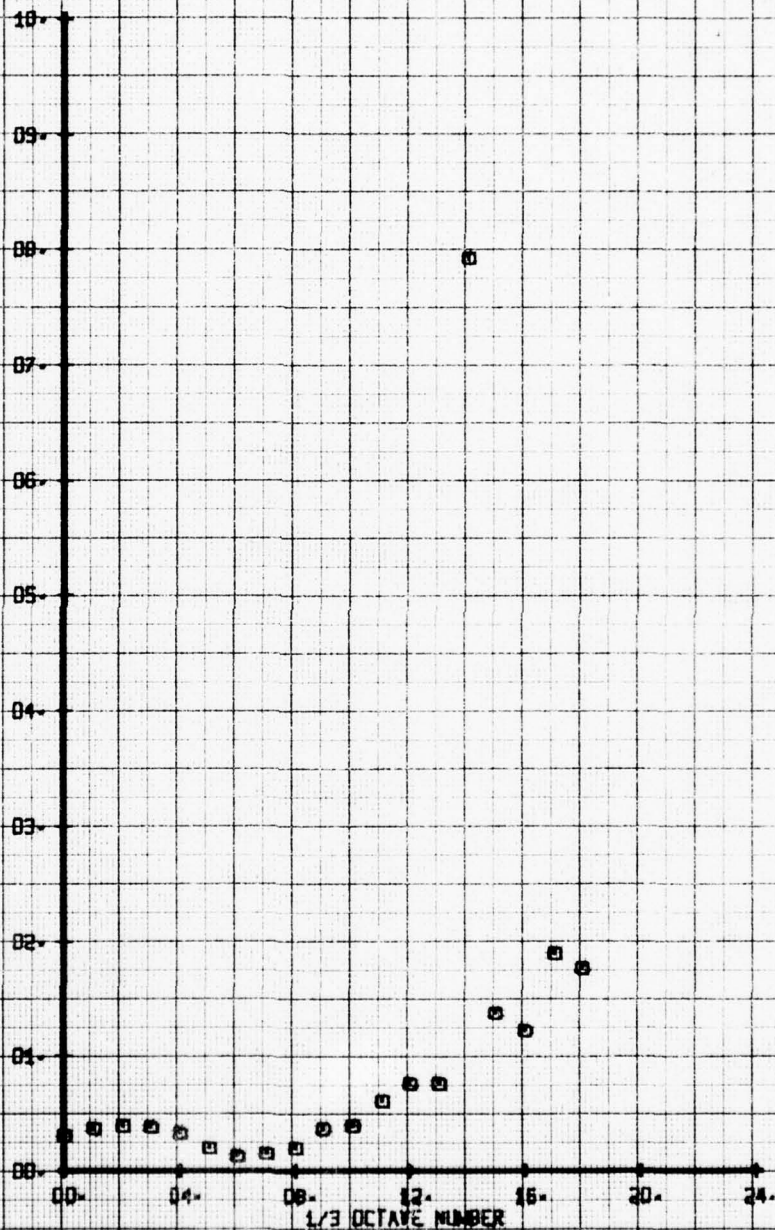




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT, W/O SHRO, CONTR PAR, 150P  
 RUN 187 TP 6

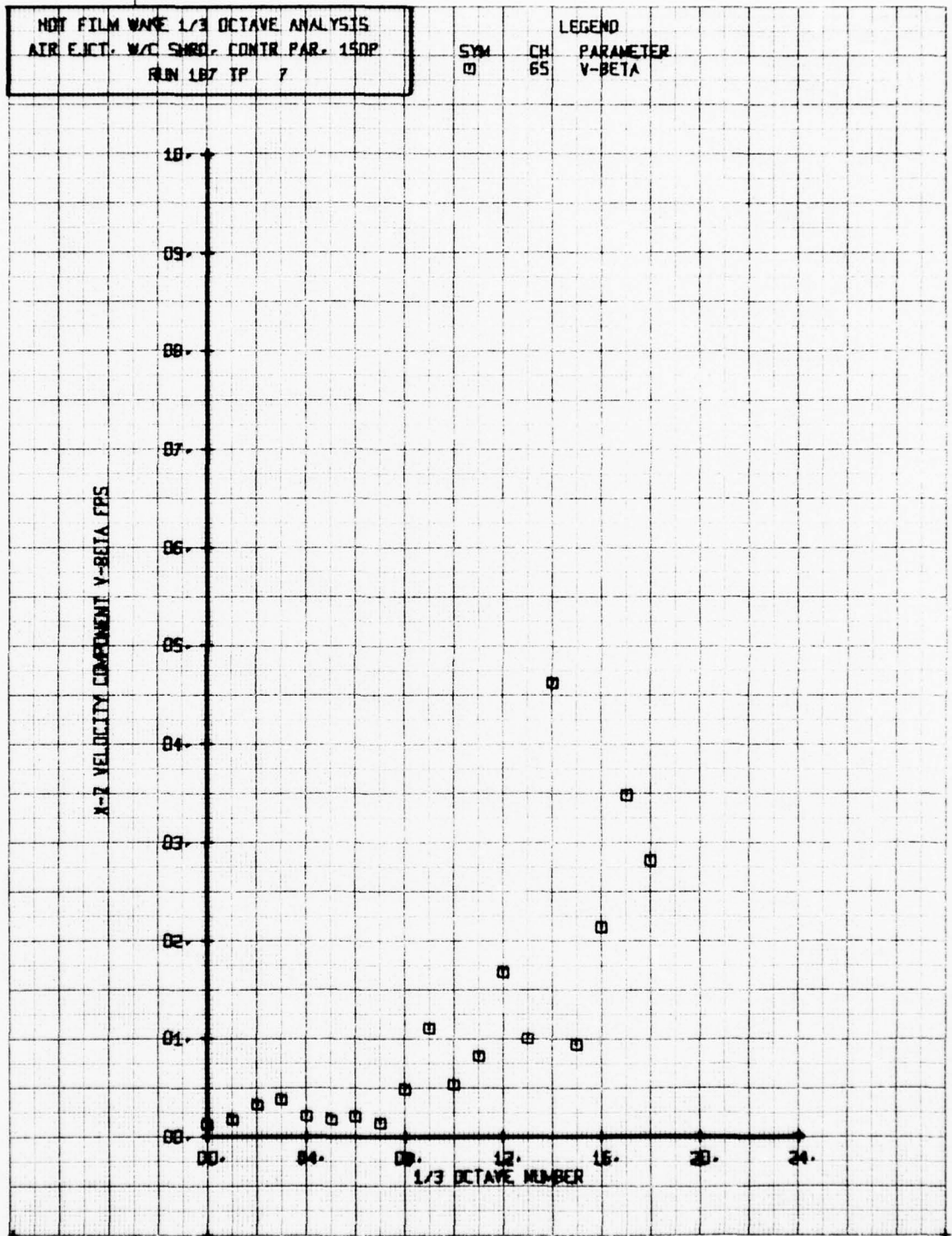
LEGEND  
 CH 65  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FHS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. W/C SHRO. CONTR. PAR. 150P  
 RUN 187 TP 7

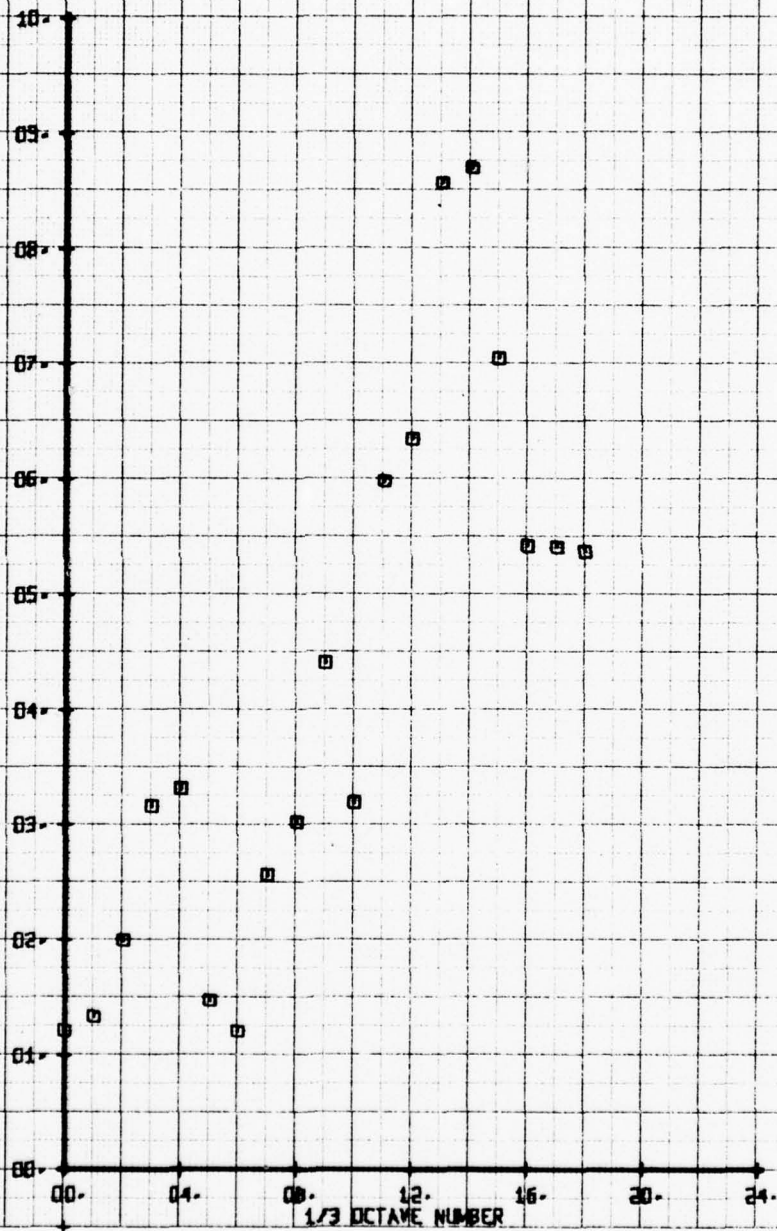
SYM	CH	LEGEND
□	65	PARAMETER V-BETA



HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT OPST  
 RUN 203 TP 5

LEGEND  
 GYM CM PARAMETER  
 0 65 BETA

LATERAL FLOW ANGLE, BETA - DEGREES



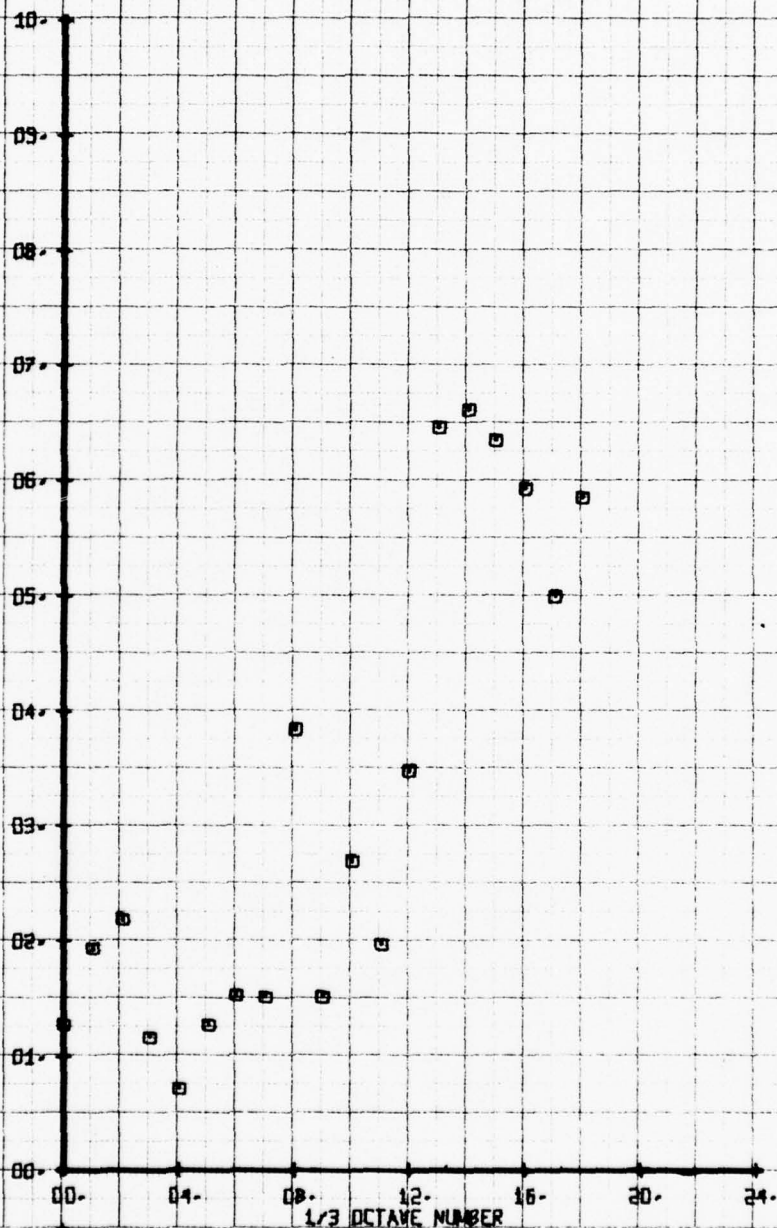
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
AIR EJECT. BIFURCATED DUCT OFSI  
RUN 203 TP 6

SYM  
□

CM  
65

LEGEND  
PARAMETER  
BETA

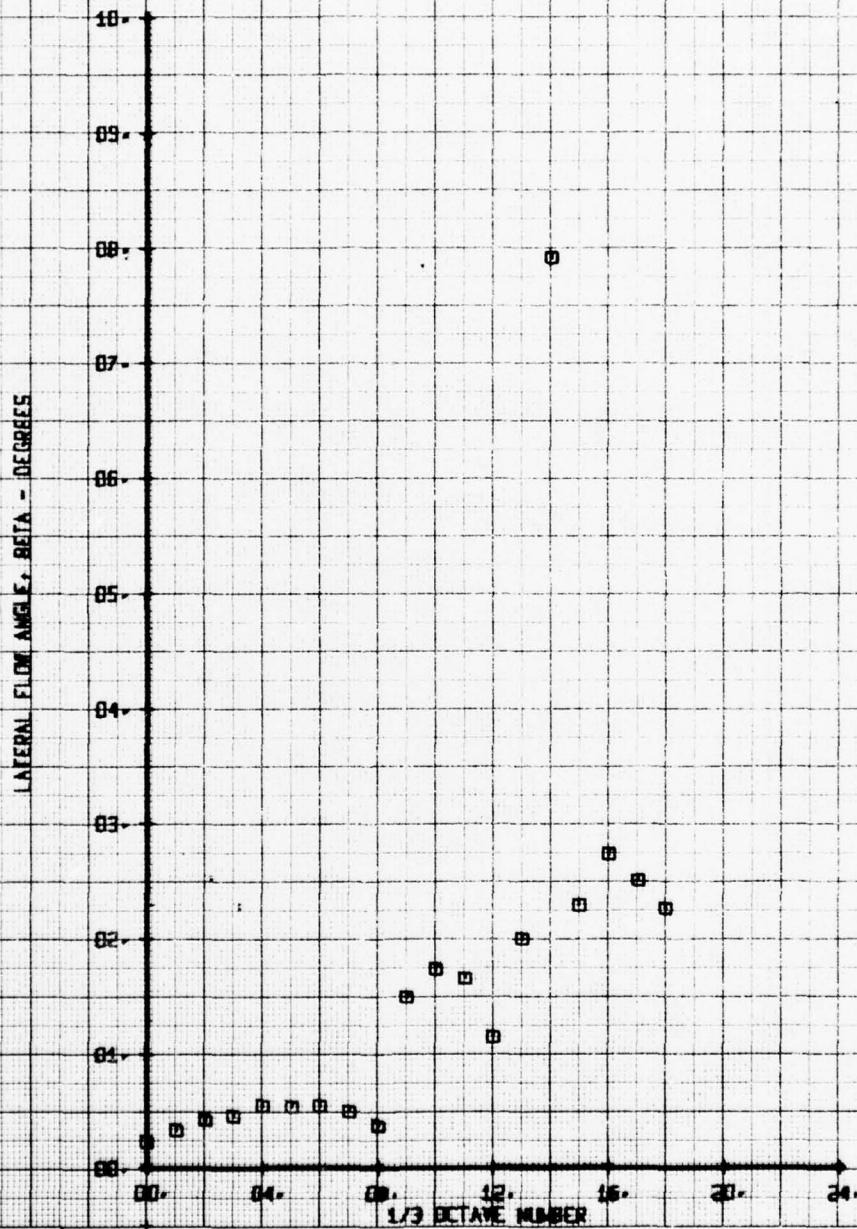
LATERAL FLOW ANGLE, BETA - DEGREES





HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT, BIFURCATED DUCT OPST  
 RUN 203 TP 7

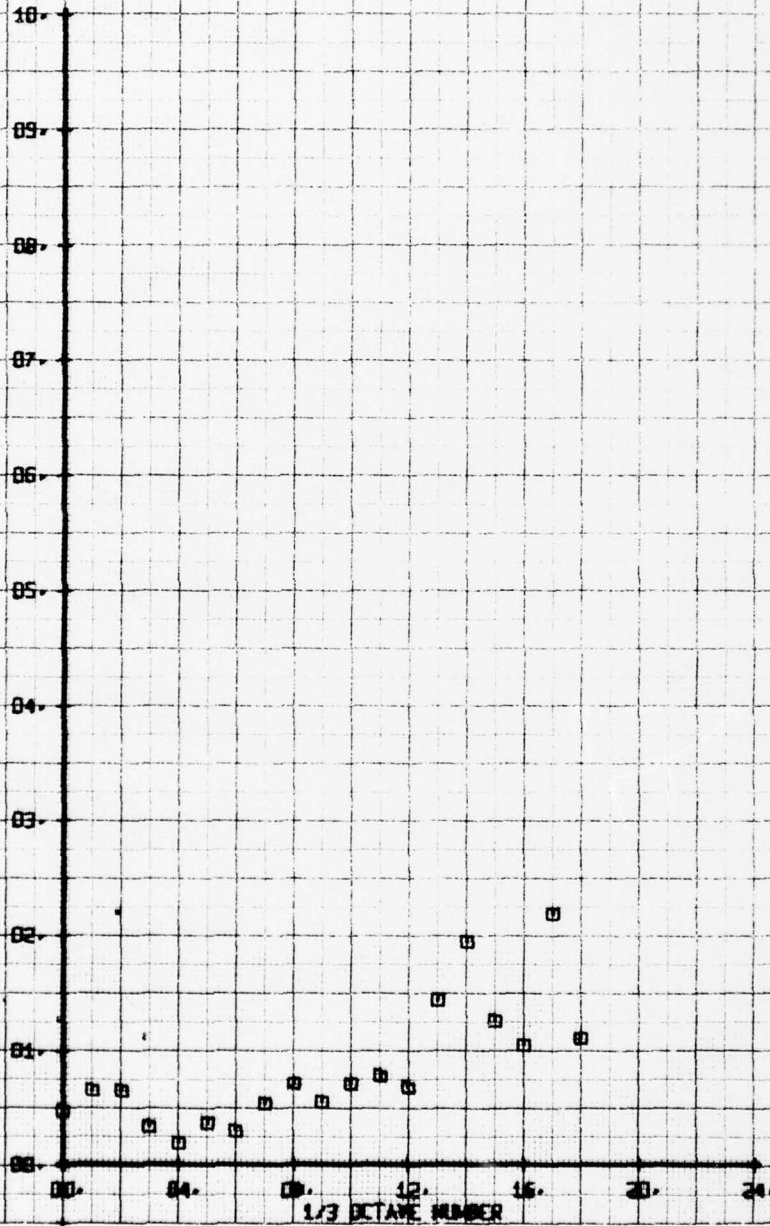
SYM	CH	PARAMETER
0	65	BETA



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT DP51  
 RUN 203 TP 8

SYM CH PARAMETER  
 □ 65 BETA

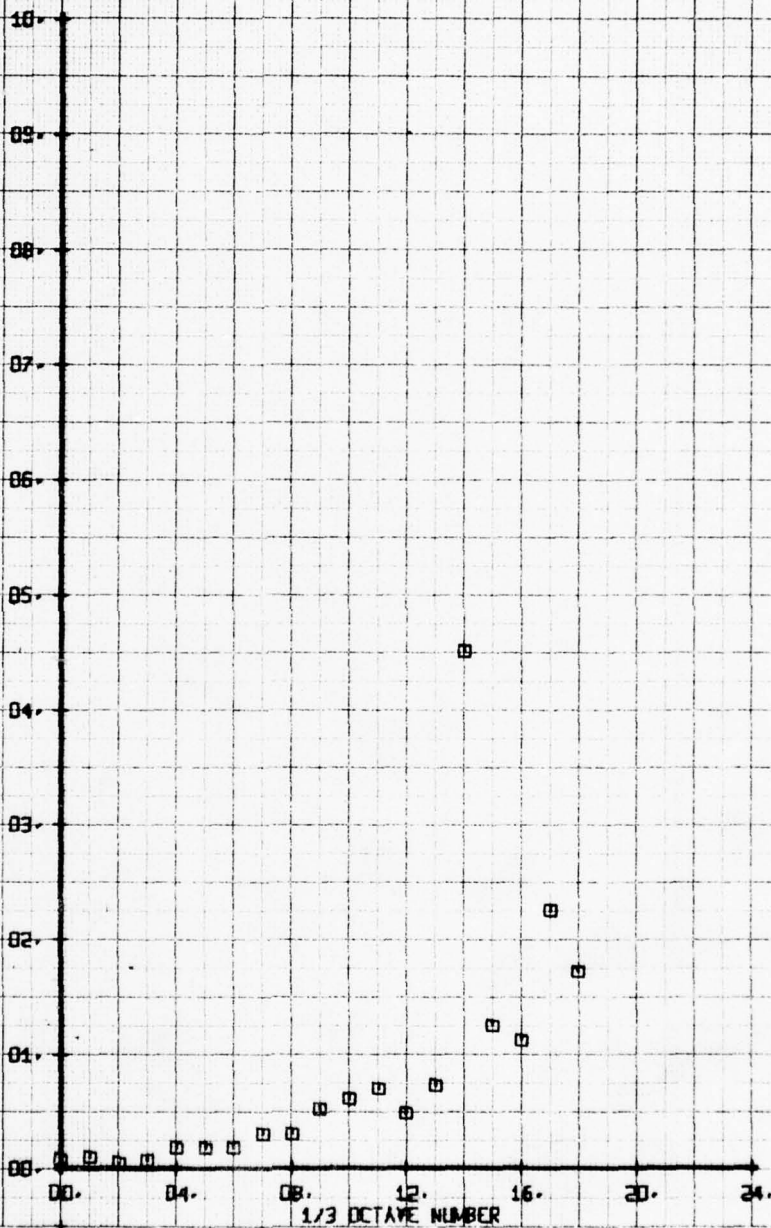
LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT DPST  
 RUN 203 TP 9

SYM	CH	LEGEND	PARAMETER
□	65		BETA

LATERAL FLOW ANGLE, BETA - DEGREES



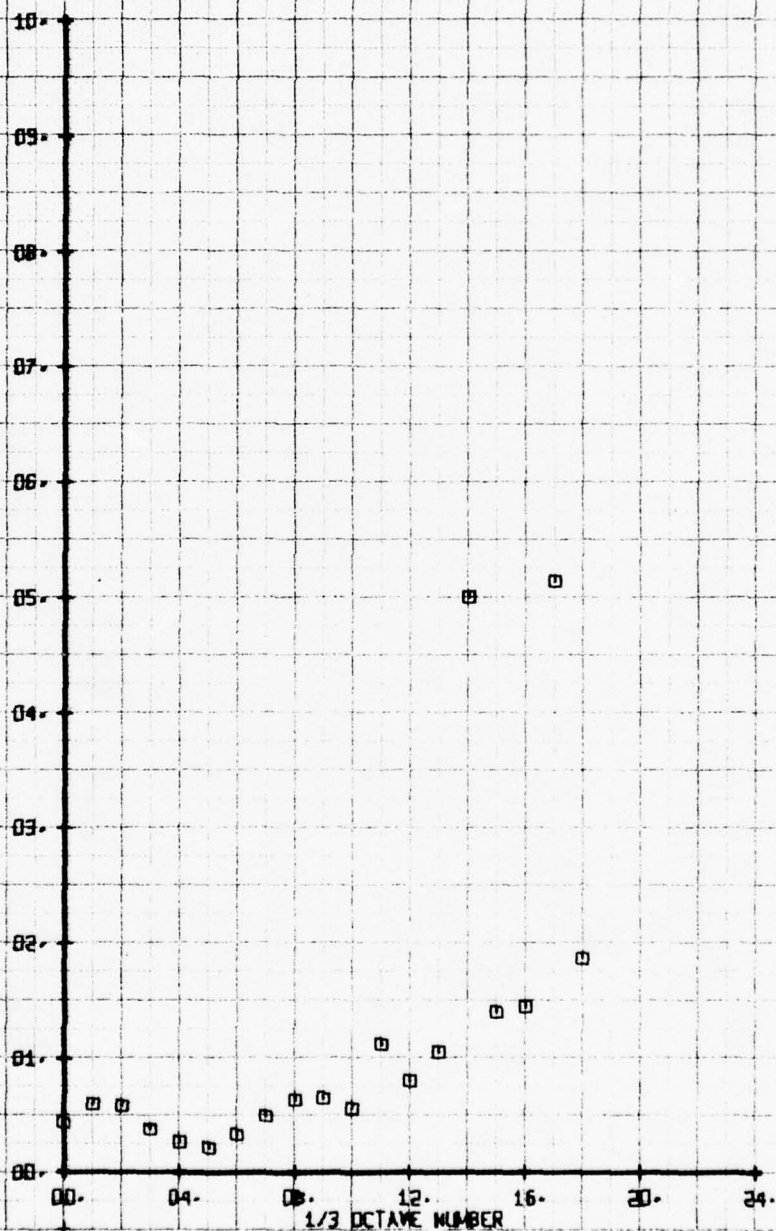
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT DPST  
 RUN 203 TP 10

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 BETA

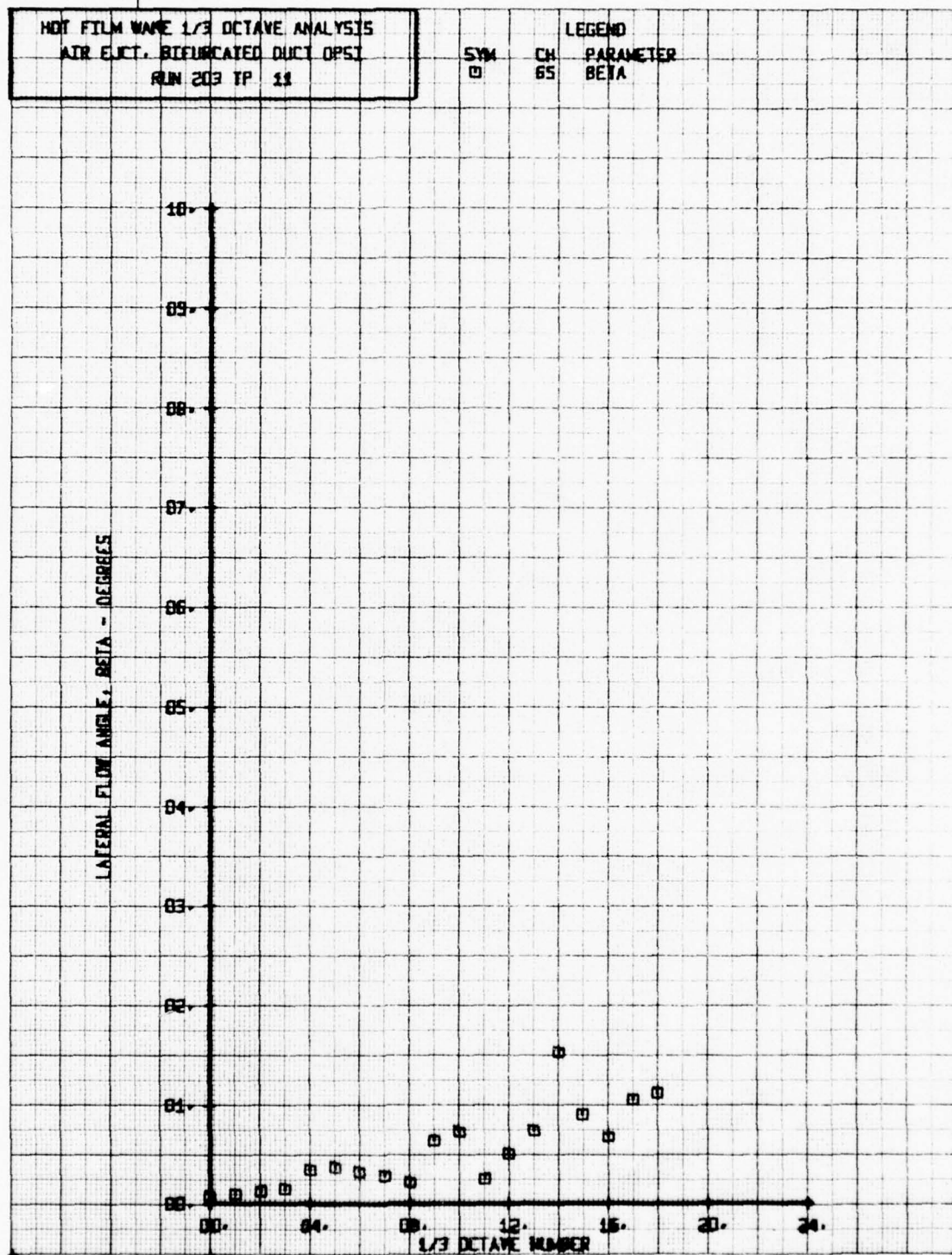
LATERAL FLOW ANGLE, BETA - DEGREES





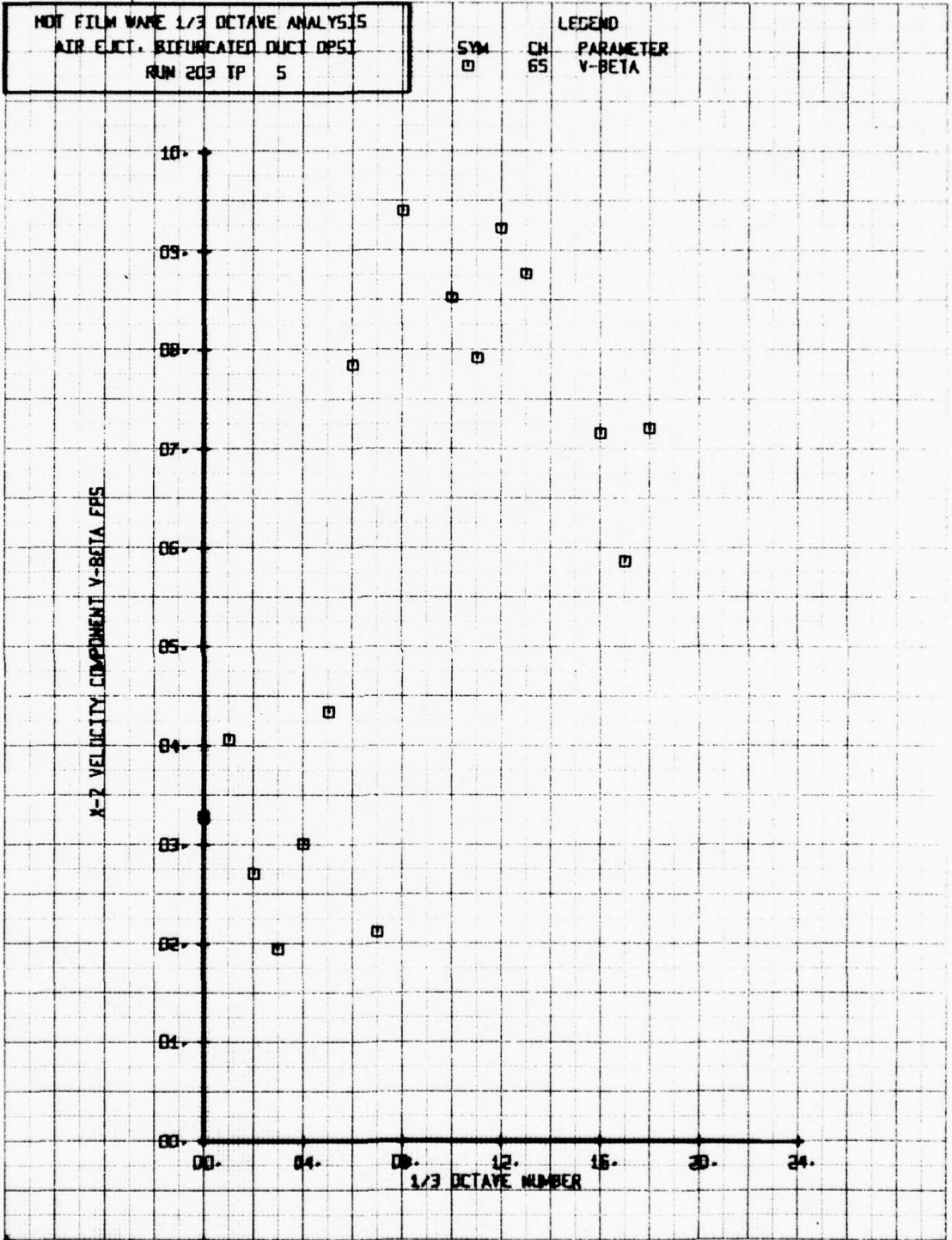
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT OPST  
 RUN 203 TP 11

LEGEND	
SYM	CH
□	65
	PARAMETER
	BETA



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT DP51  
 RUN 203 TP 5

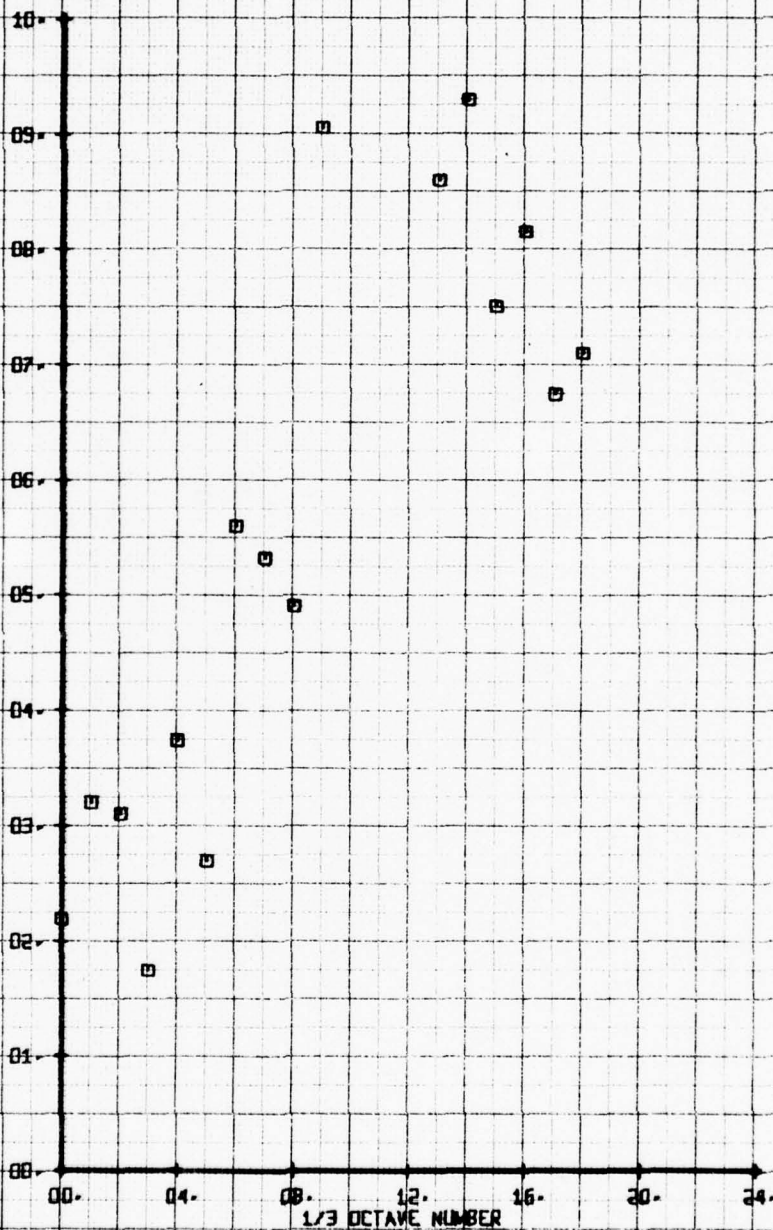
SYM  $\square$  CH 65  
 LEGEND  
 PARAMETER  
 V-BETA



NOT FILM WARE 1/3 OCTAVE ANALYSIS  
 ATR EJECT. BIFURCATED DUCT DPST  
 RUN 203 TP 6

LEGEND  
 SYM CH PARAMETER  
 □ 65 V-BETA

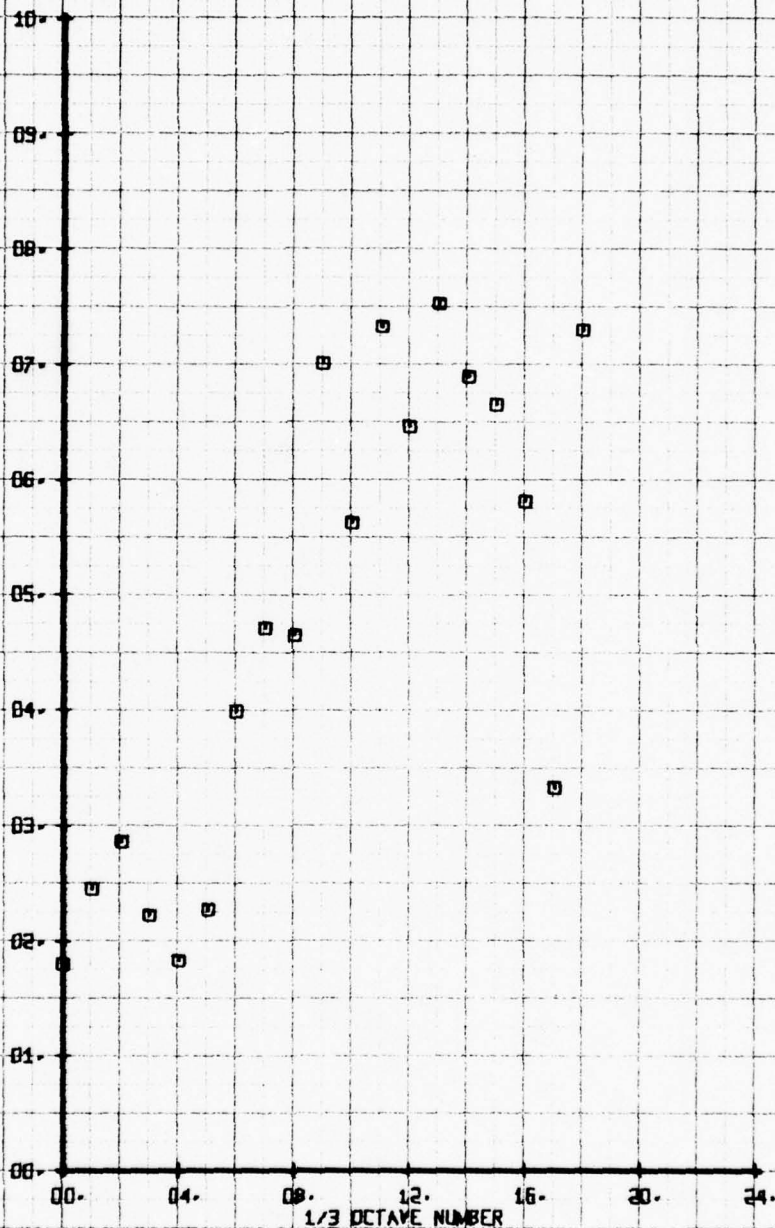
X-2 VELOCITY COMPONENT V-BETA FHS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 ADR EJECT, BIFURCATED DUCT DPST  
 RUN 203 TP 7

SYN CH  
 0 65  
 LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FFS





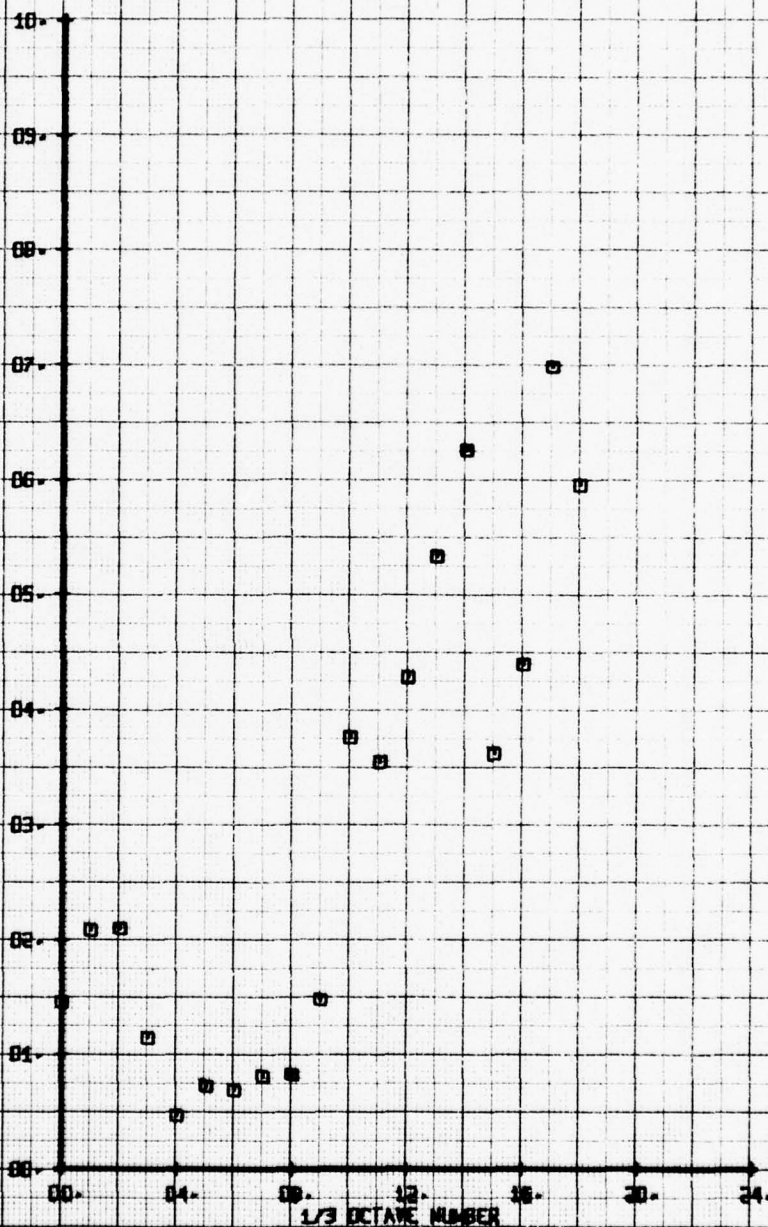
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT OPST  
 RUN 203 TP B

SYM  
 0

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



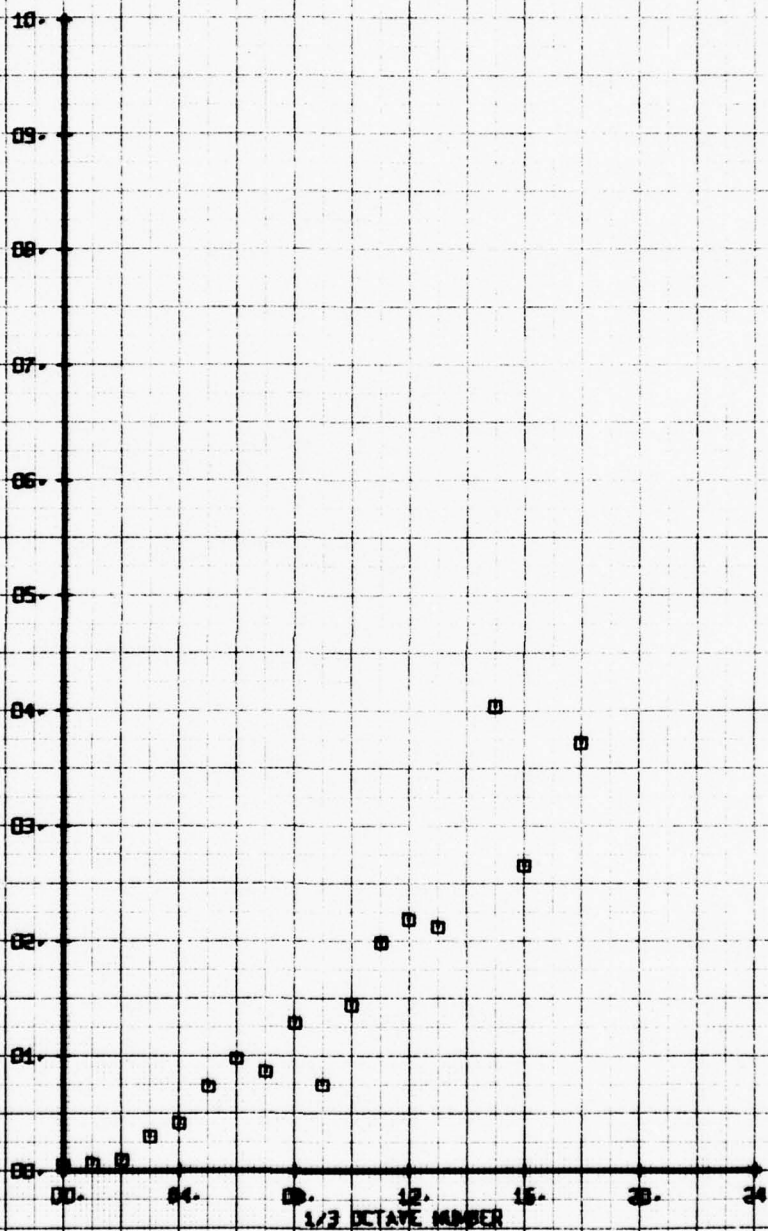
NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT DP51  
 RUN 203 TP 9

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



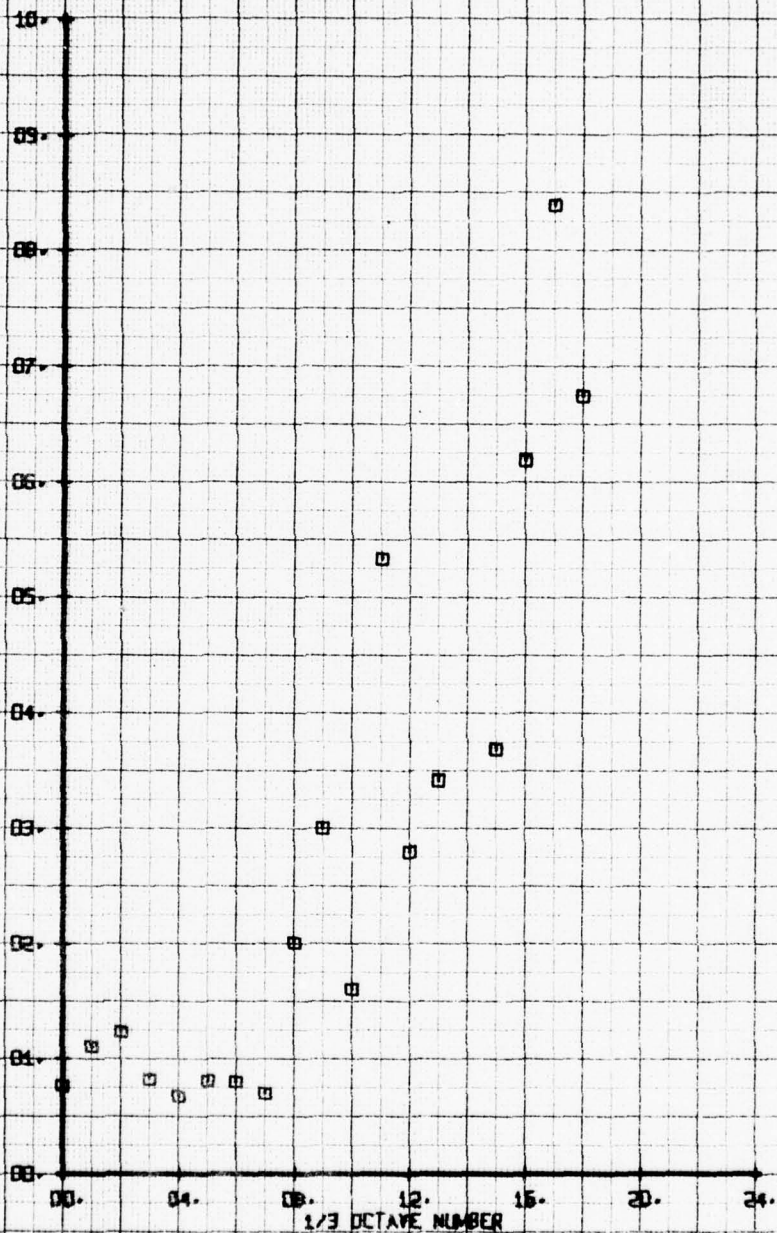
NOY FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR FLOW. RECTANGULAR DUCT OPSI  
 RUN 2013 TP 10

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

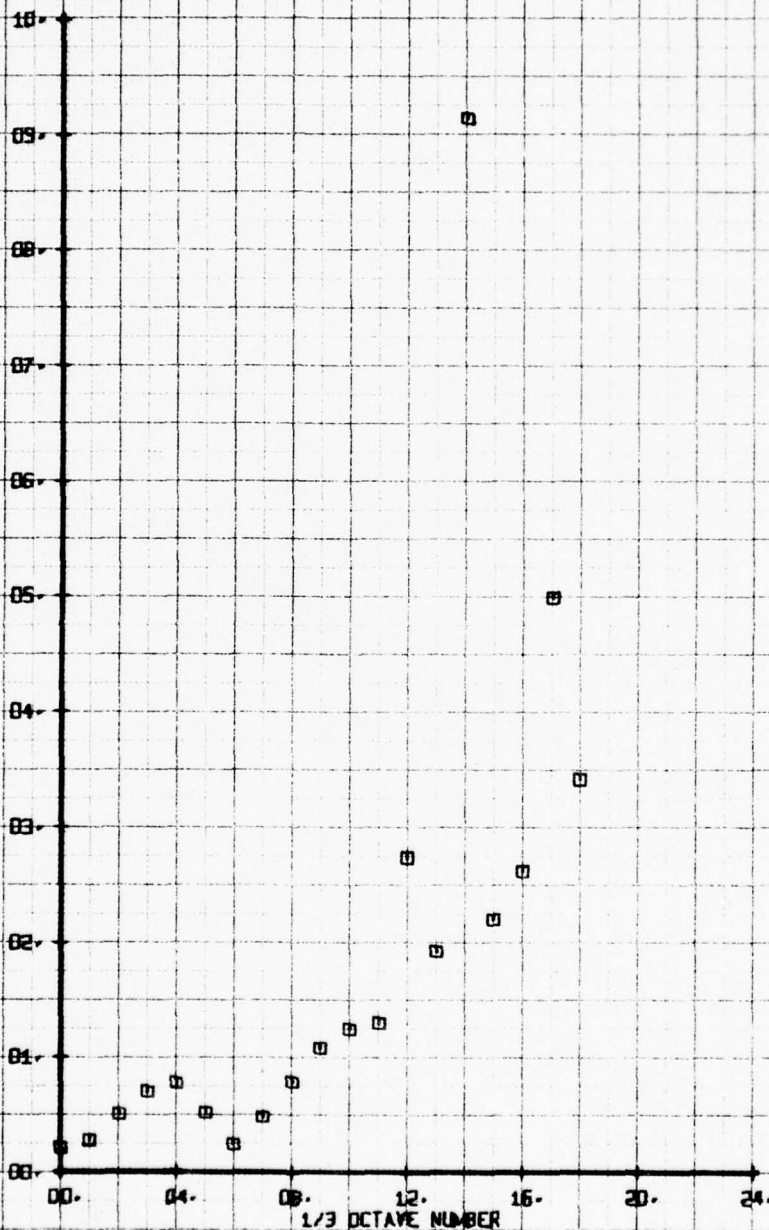
K-2 VELOCITY COMPONENT V-BETA FBS



NOI FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT OPST  
 RUN 203 TP 11

SYN CH PARAMETER  
 0 65 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS





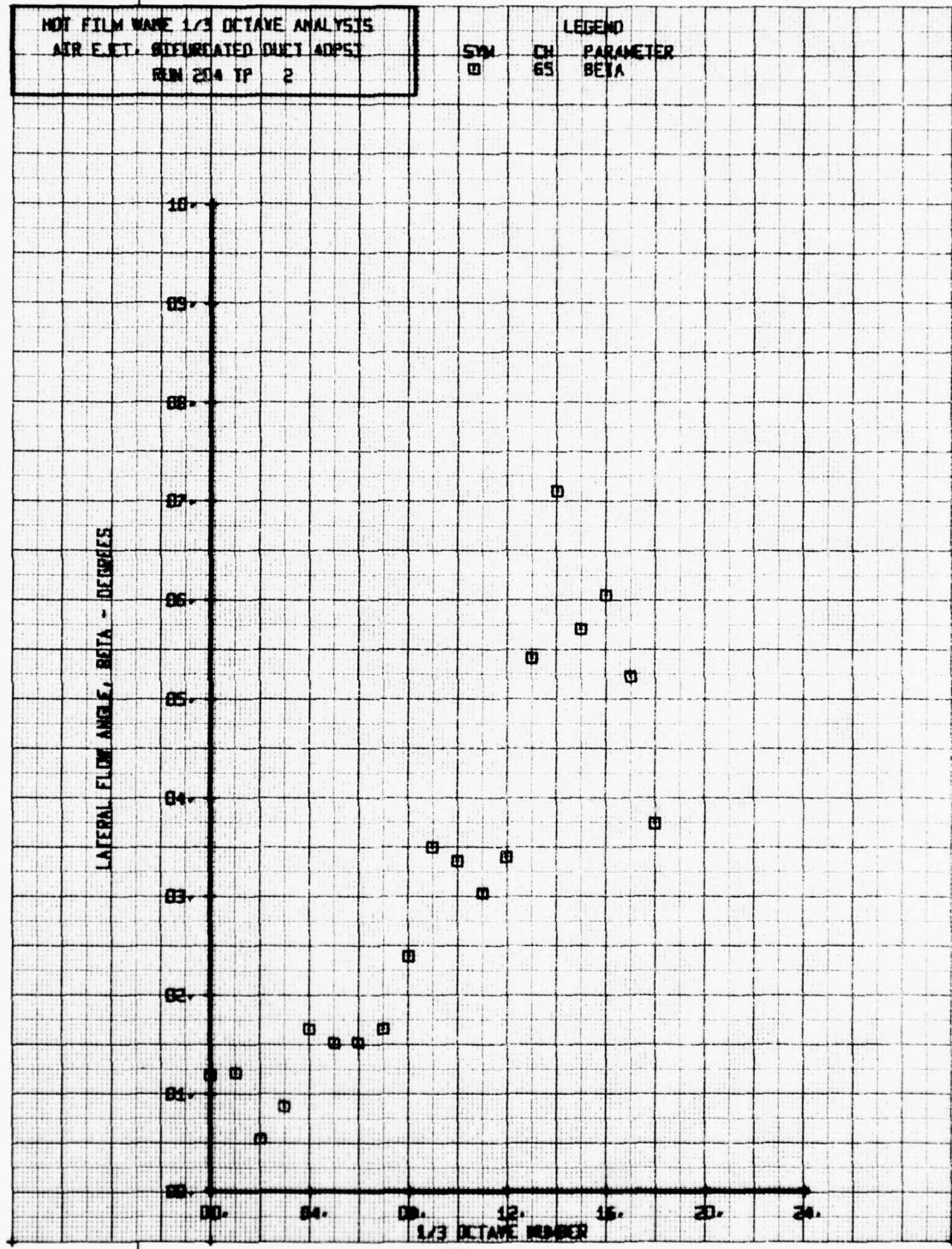
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR F.T. STIMULATED DUCT ADPST  
 RUN 204 TP 2

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 BETA

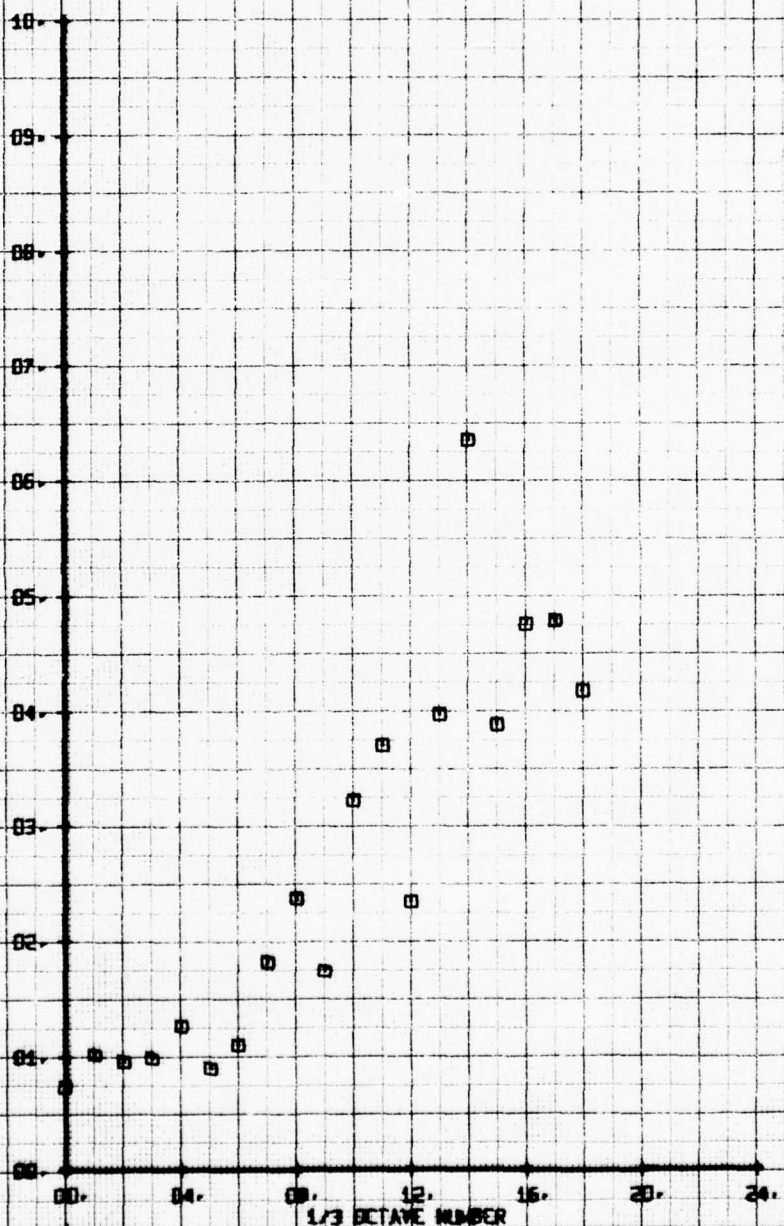
LATERAL FLOW ANGLE, BETA - DEGREES



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR ECT. BIFURCATED DUCT 40PSI  
 RUN 204 TP 3

SYN CH PARAMETER  
 0 65 BETA

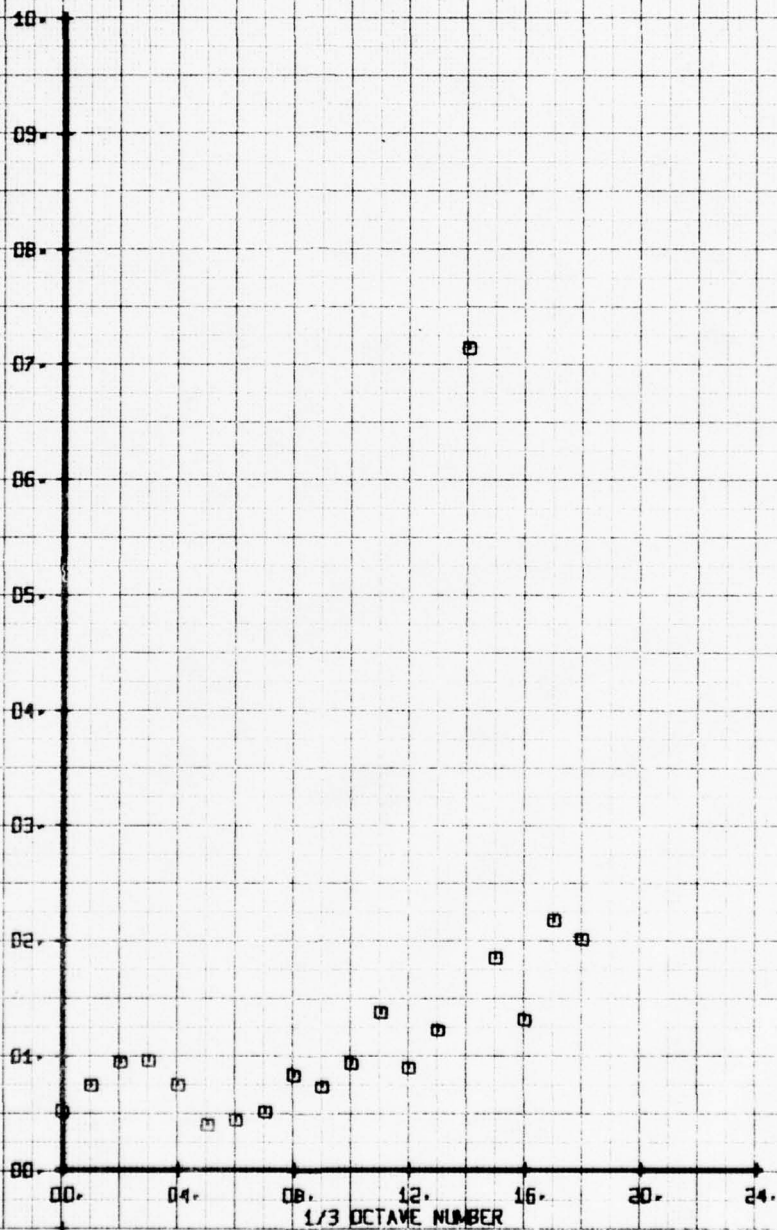
LATERAL FLOW ANGLE, BETA - DEGREES



HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR FLOW, BIFURCATED DUCT 40PSI  
 RUN 204 TP 4

SYM	CH	PARAMETER
□	65	BETA

LATERAL FLOW ANGLE, BETA - DEGREES



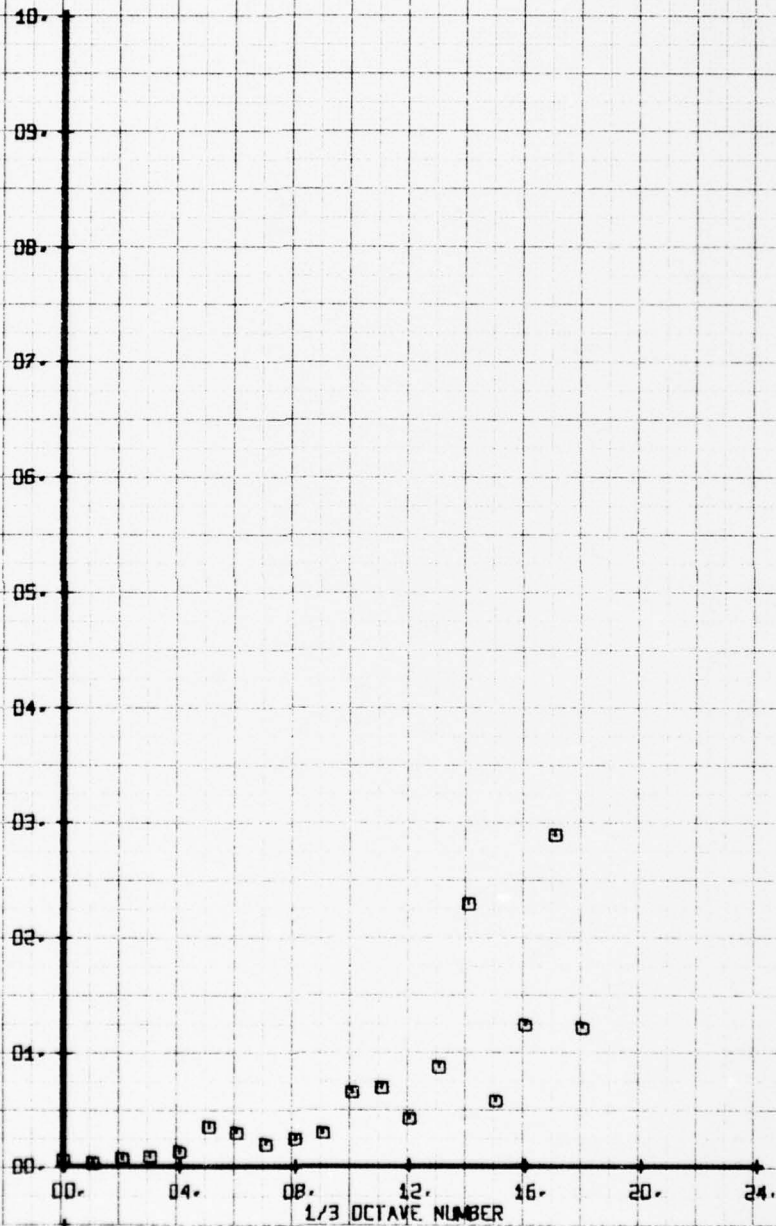
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
AIR EJECT. BIFURCATED DUCT 40PSI  
RUN 204 TP 5

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA

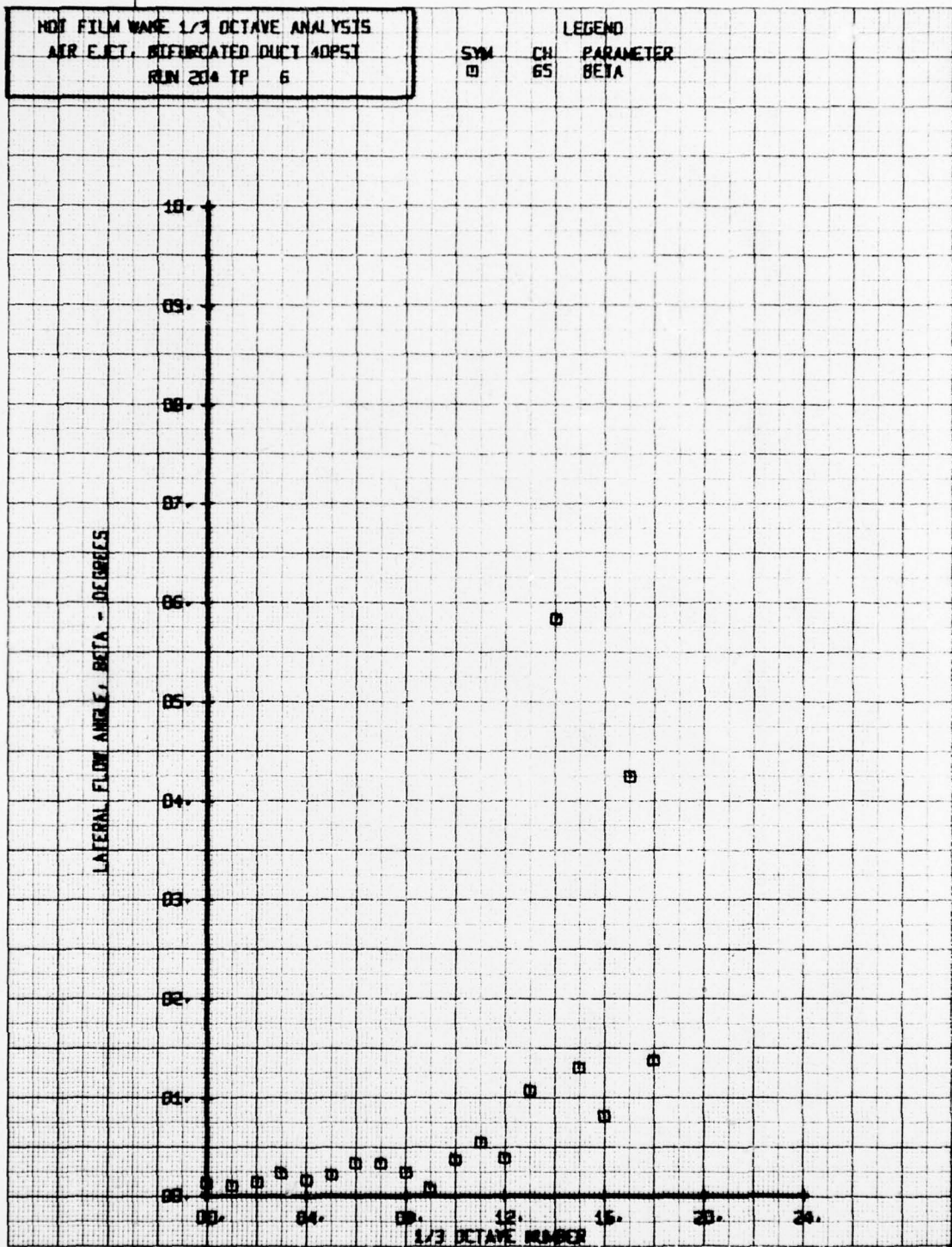
LATERAL FLOW ANGLE, BETA - DEGREES





NOI FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR ECT. BIFURCATED DUCT 10P51  
 RUN 204 TP 6

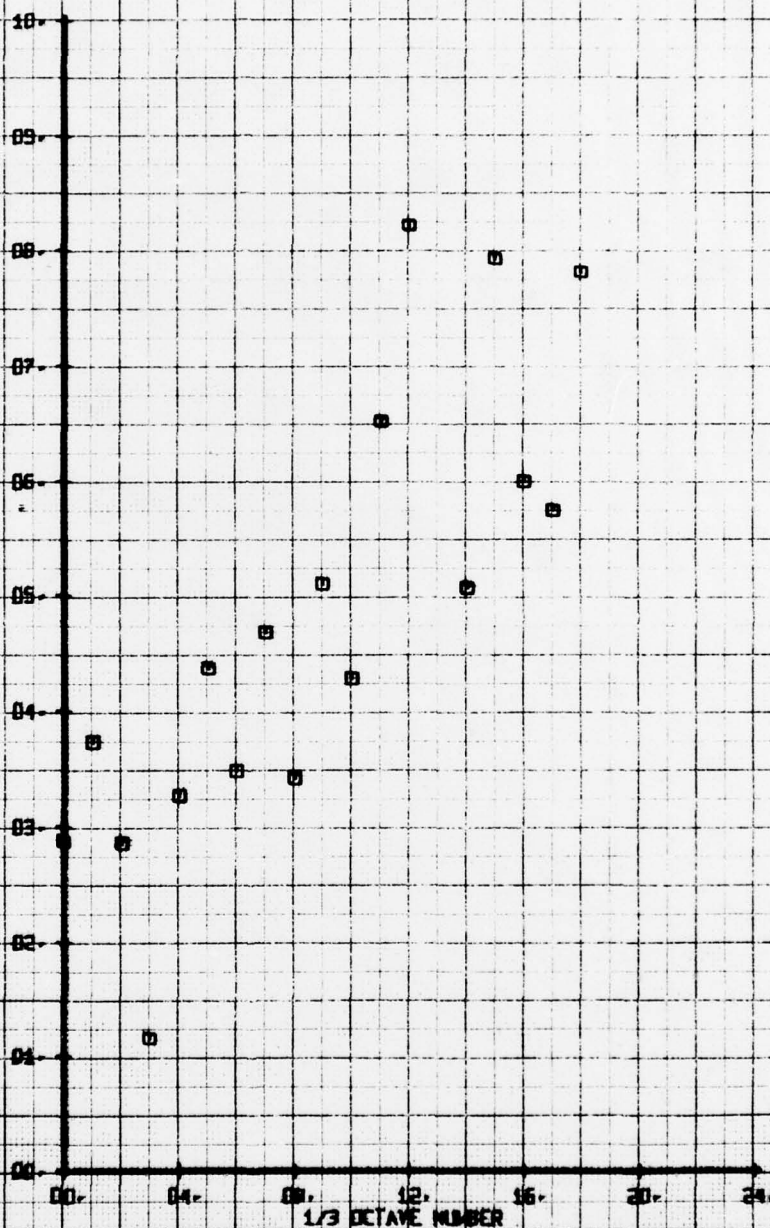
SYM	CH	PARAMETER
□	65	BETA



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR E.C.T. BIFURCATED DUCT 40PSI  
 RUN 204 TP 2

SYM CH PARAMETER  
 □ 65 V-BETA

X-2 VELOCITY COMPONENT V-BETA FBS



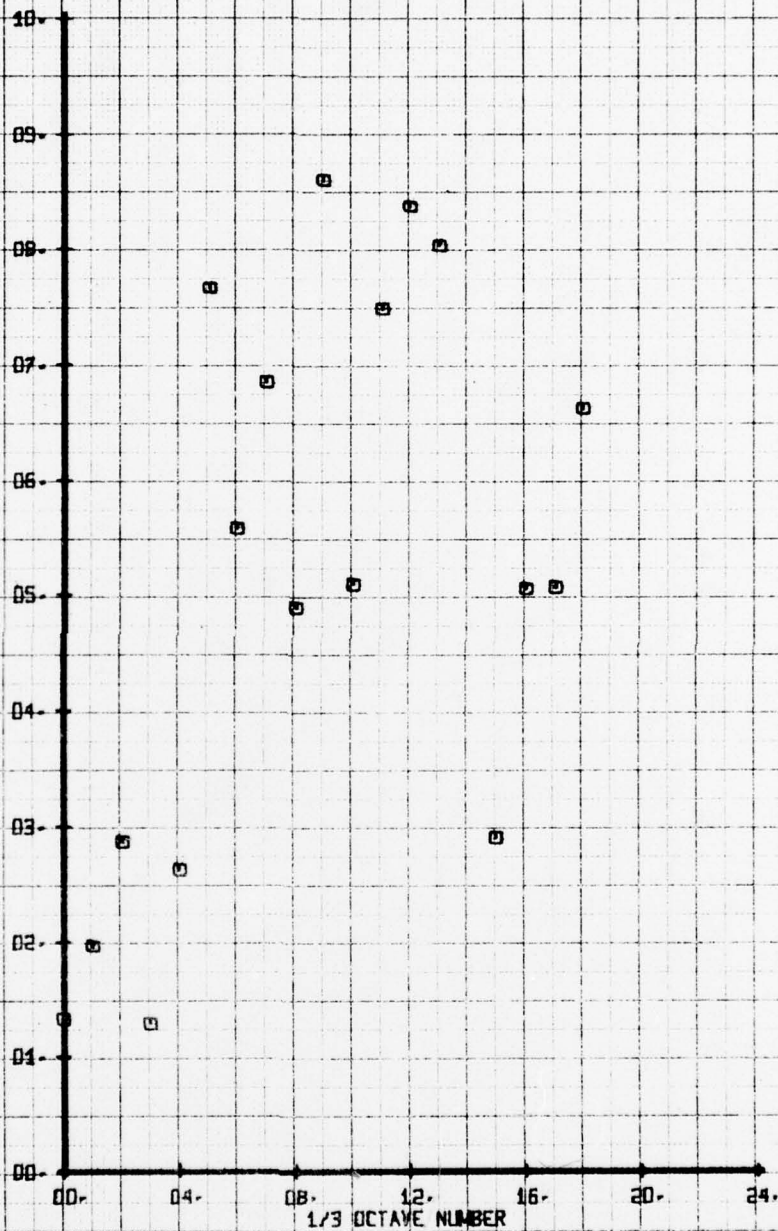
NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
AIR ECT. BIFURCATED DUCT 40PSI  
RUN 204 TP 3

SYM  
□

CH  
65

LEGEND  
PARAMETER  
V-BETA

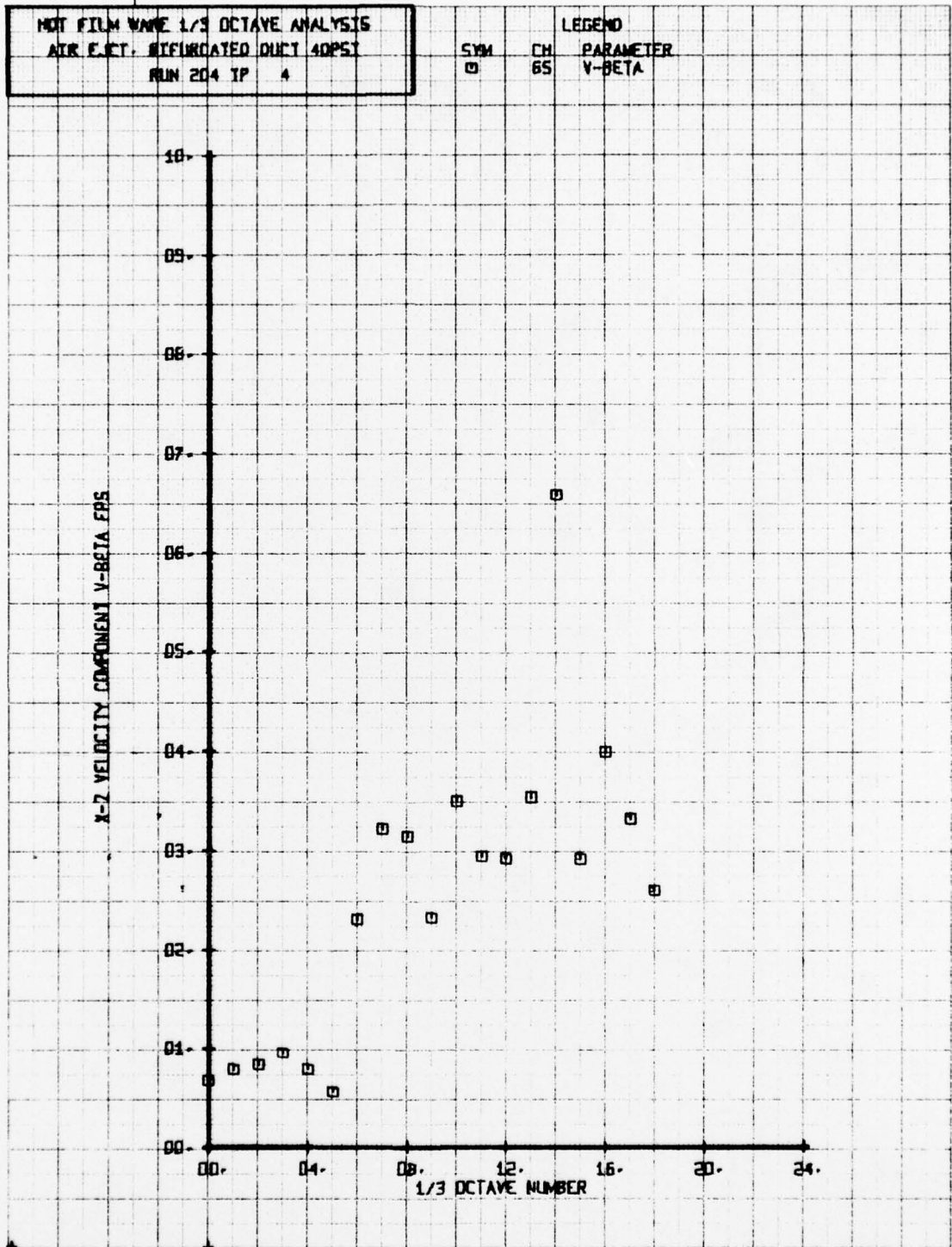
X-2 VELOCITY COMPONENT V-BETA FBS





NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT 40PST  
 RUN 204 IP 4

SYM	CH	LEGEND
□	65	PARAMETER V-BETA

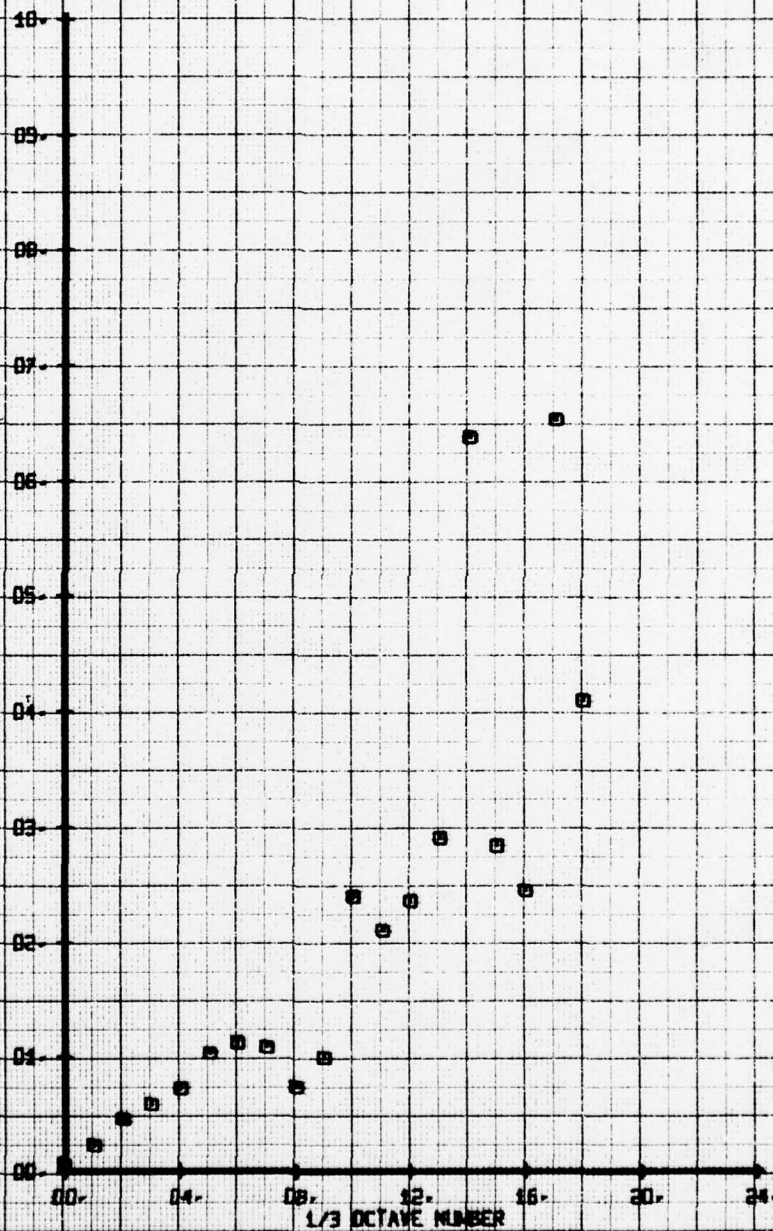




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT 40PSI  
 RUN 204 TP 5

SYN CH PARAMETER  
 0 65 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS



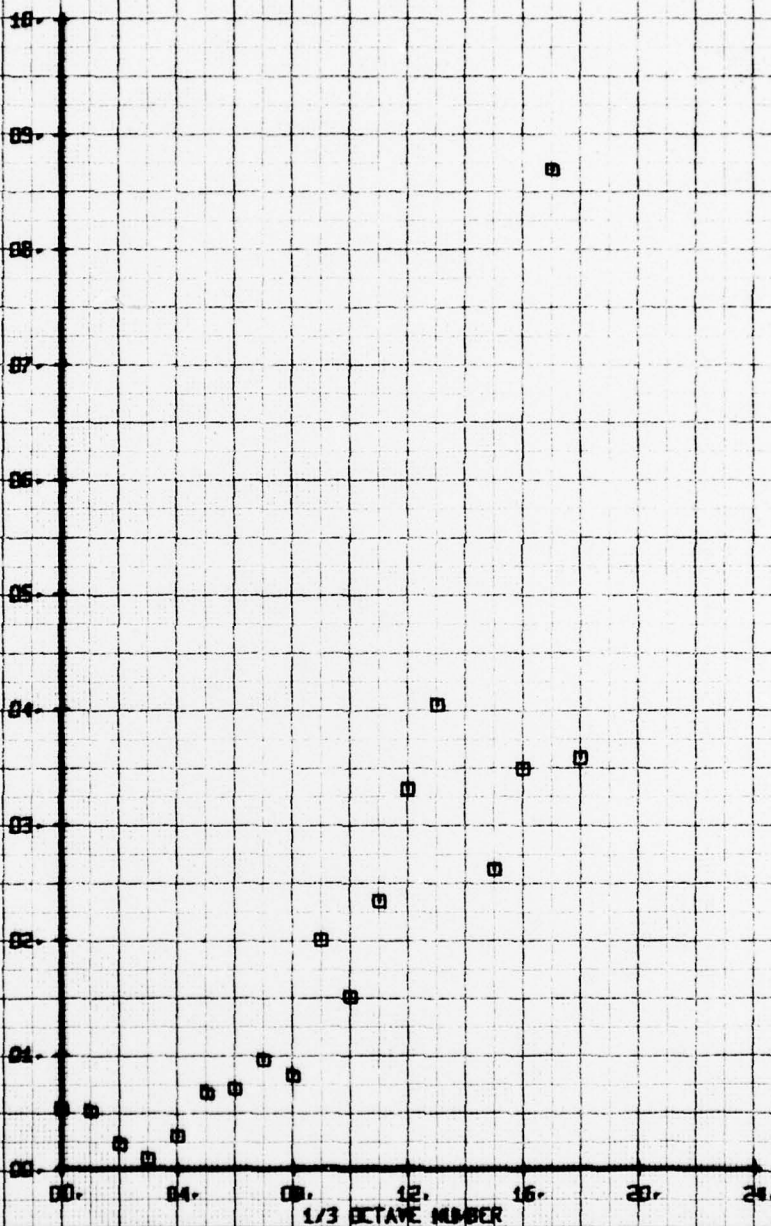
NOT FILM WARE 1/3 OCTAVE ANALYSIS  
 AIR F.T. STIMULATED DUCT 40PSI  
 RUN 204 TP 6

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

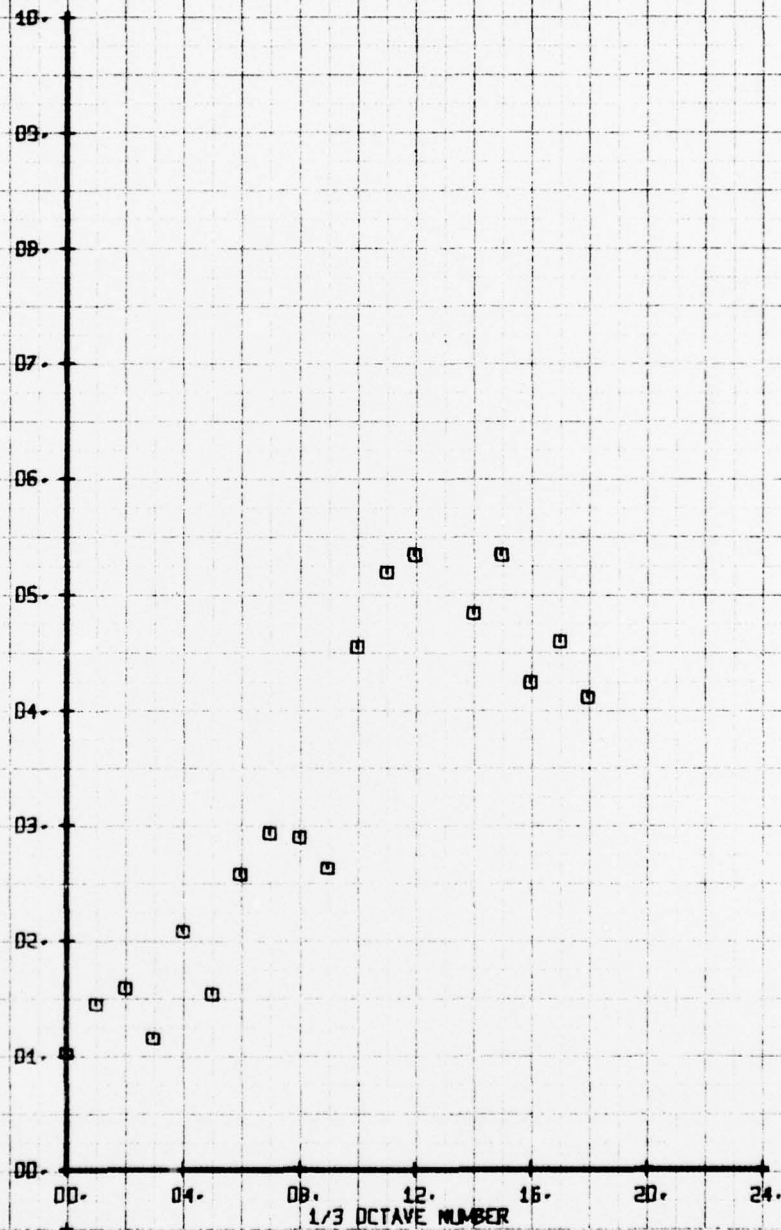
X-Z VELOCITY COMPONENT V-BETA FPS



HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
AIR EJECT. BIFURCATED DUCT 150PSI  
RUN 205 TP 1

LEGEND  
SYM CH PARAMETER  
□ 65 BETA

LATERAL FLOW ANGLE, BETA - DEGREES





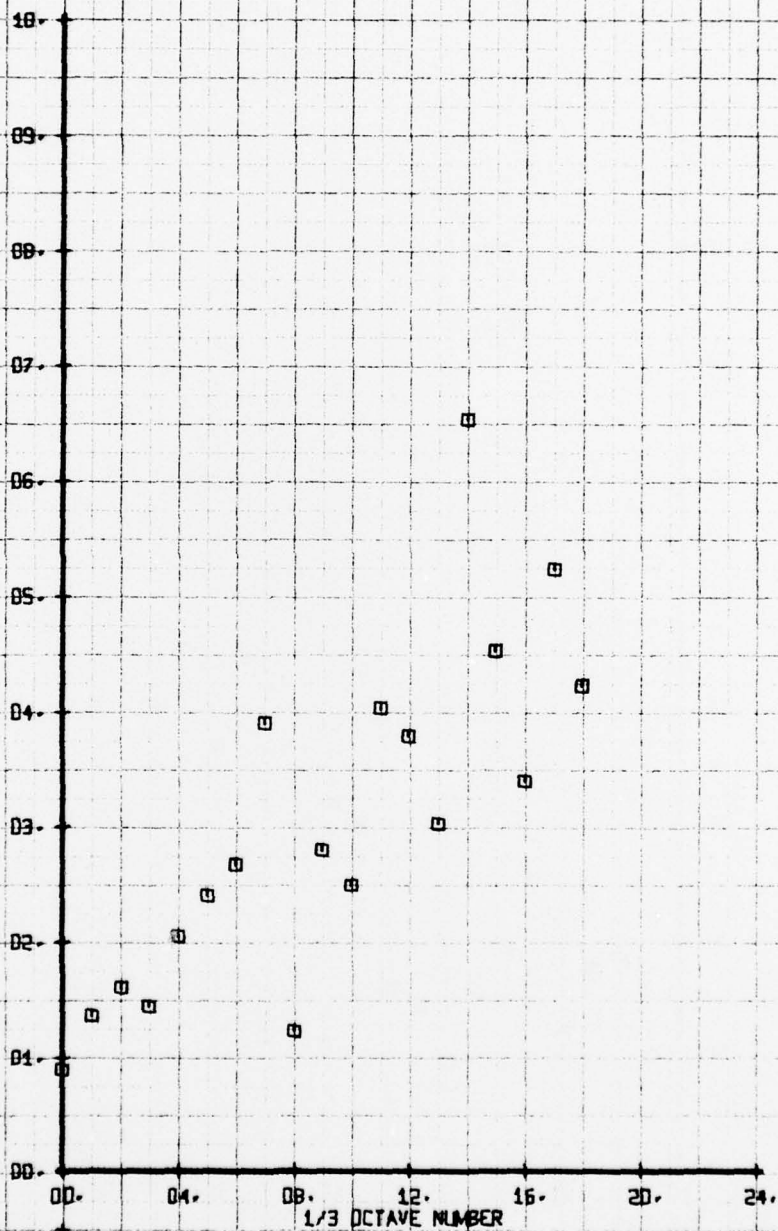
NOY FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT 150PSI  
 RUN 205 TP 2

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 BETA

LATERAL FLOW ANGLE, BETA - DEGREES

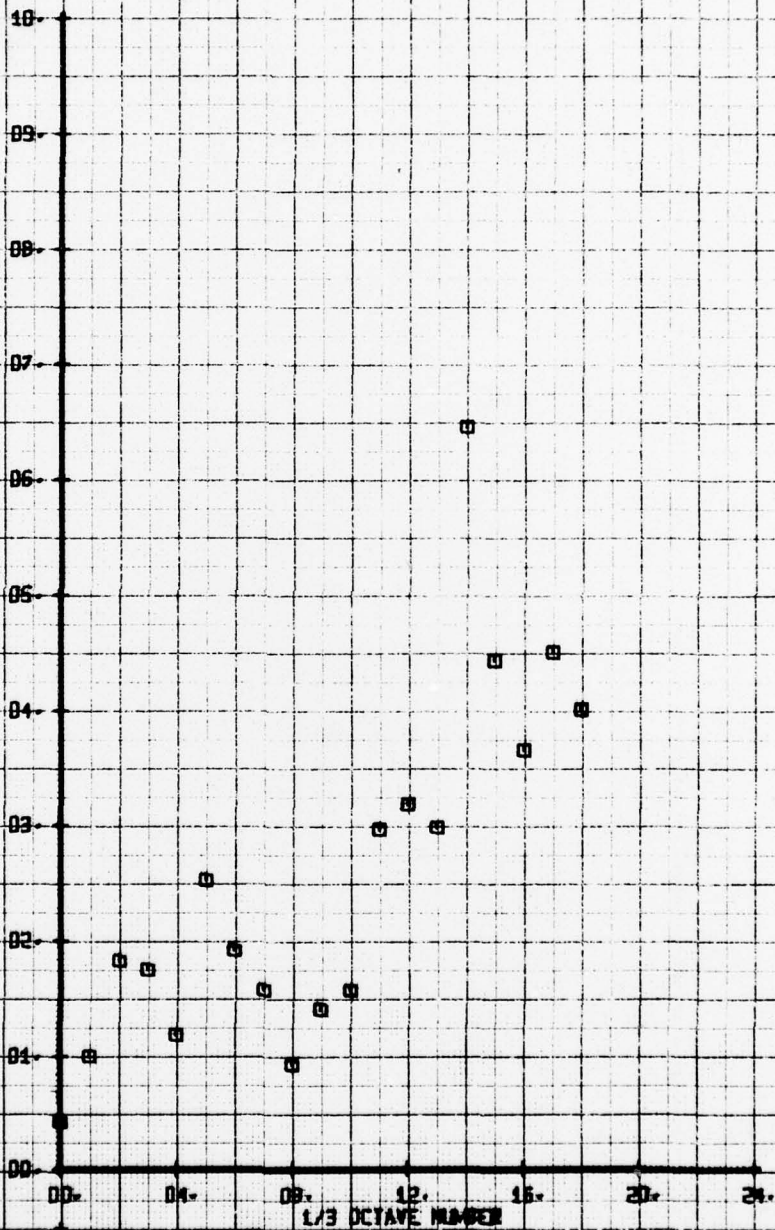




HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT 150PSI  
 RUN 205 TP 3

SYM CH PARAMETER  
 □ 65 BETA

LATERAL FLOW ANGLE, BETA - DEGREES

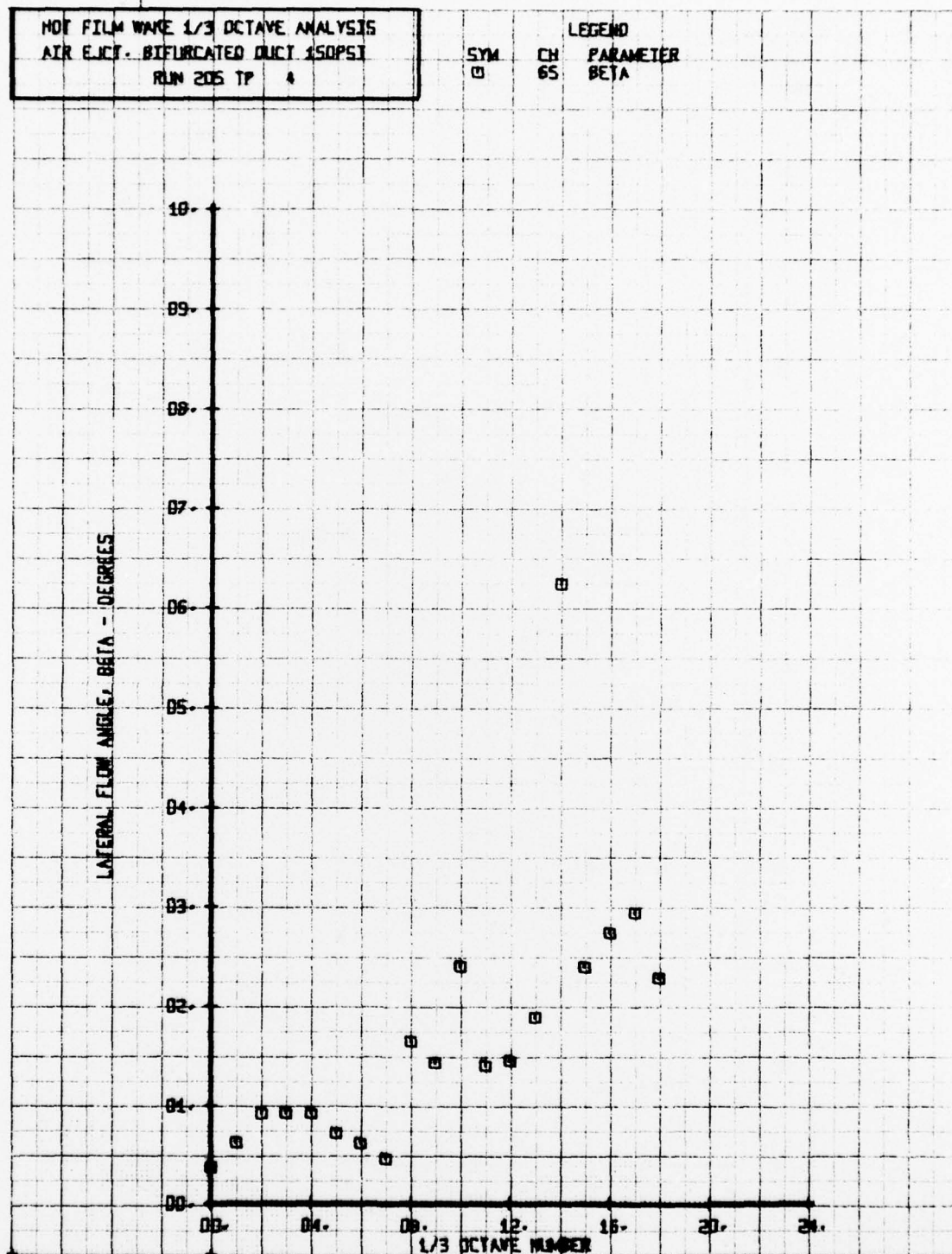


NOT FILM WAKE 1/3 OCTAVE ANALYSIS  
AIR EJECT. BIFURCATED DUCT 150PSI  
RUN 205 TP 4

SYM  
□

CH  
65

LEGEND  
PARAMETER  
BETA



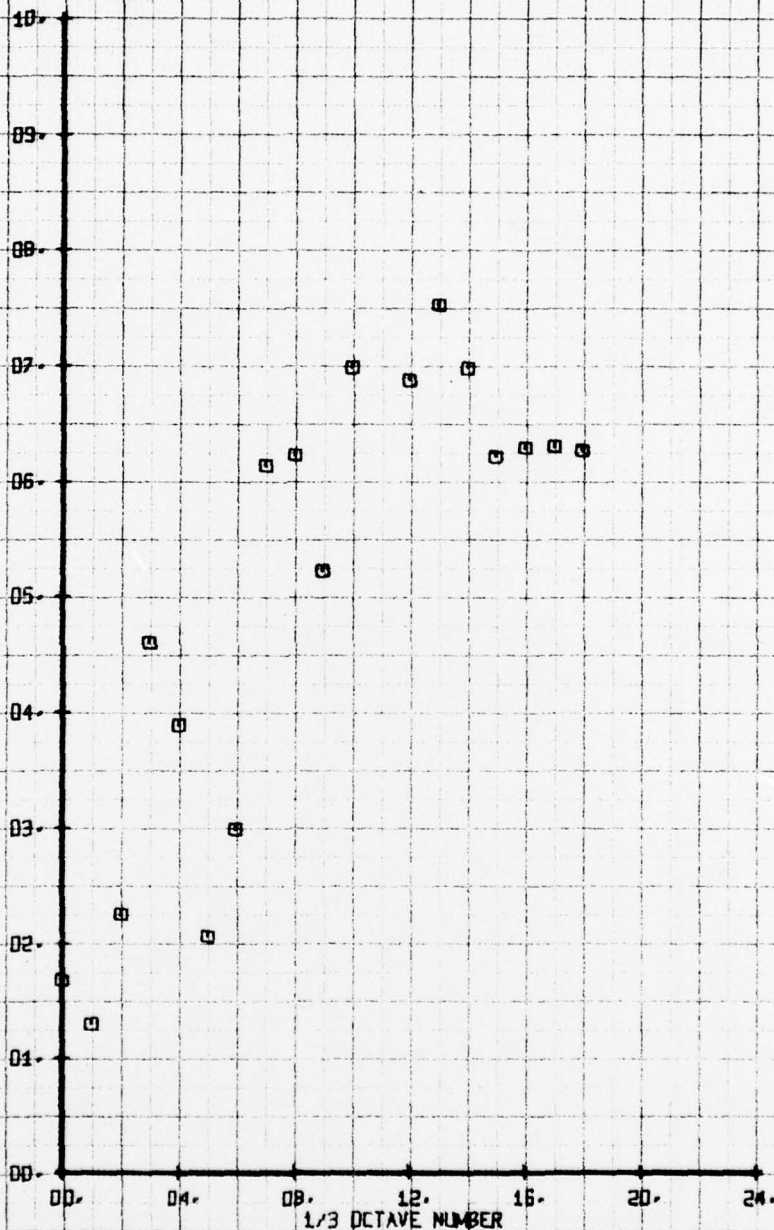
HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR ECT. BIFURCATED DUCT 150PSI  
 RUN 205 TP 1

SYM  
 0

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-Z VELOCITY COMPONENT V-BETA FPS

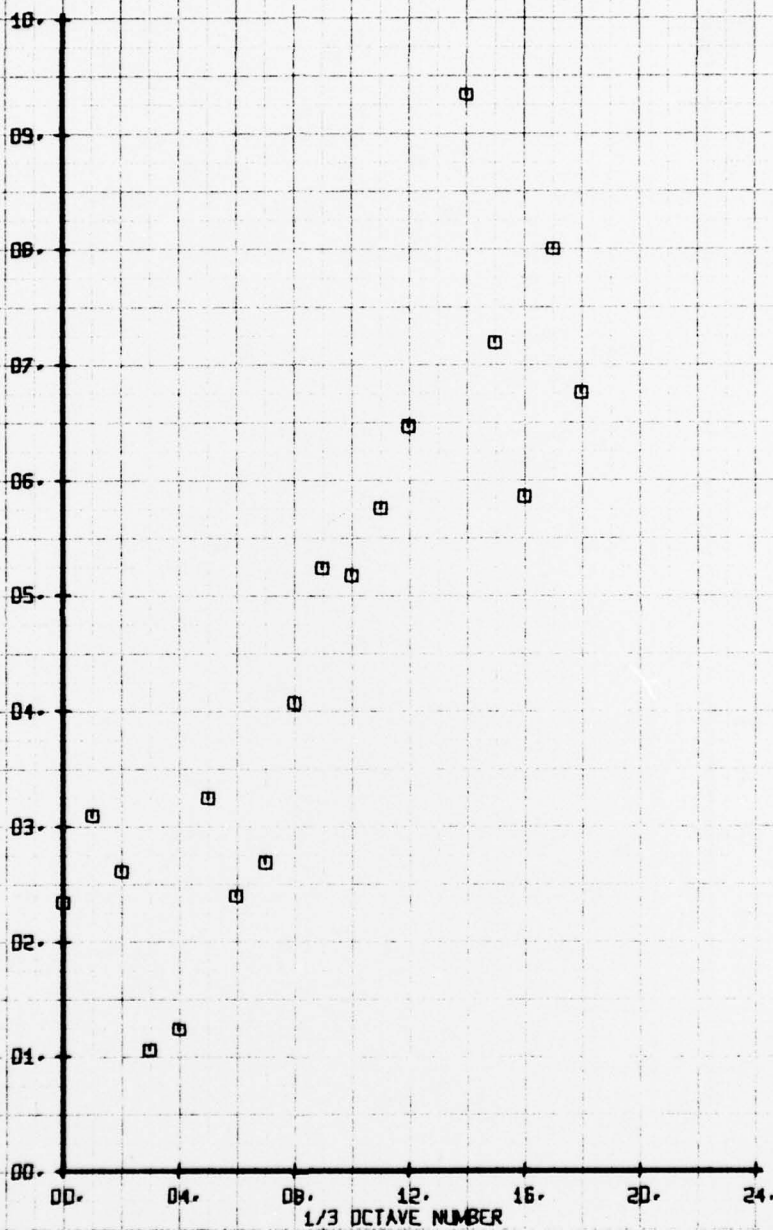


HOT FILM WAKE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT 450PST  
 RUN 205 TP 2

SYM  
 □

LEGEND  
 CH 65  
 PARAMETER  
 V-BETA

X-Z VELOCITY COMPONENT V-BETA FPS





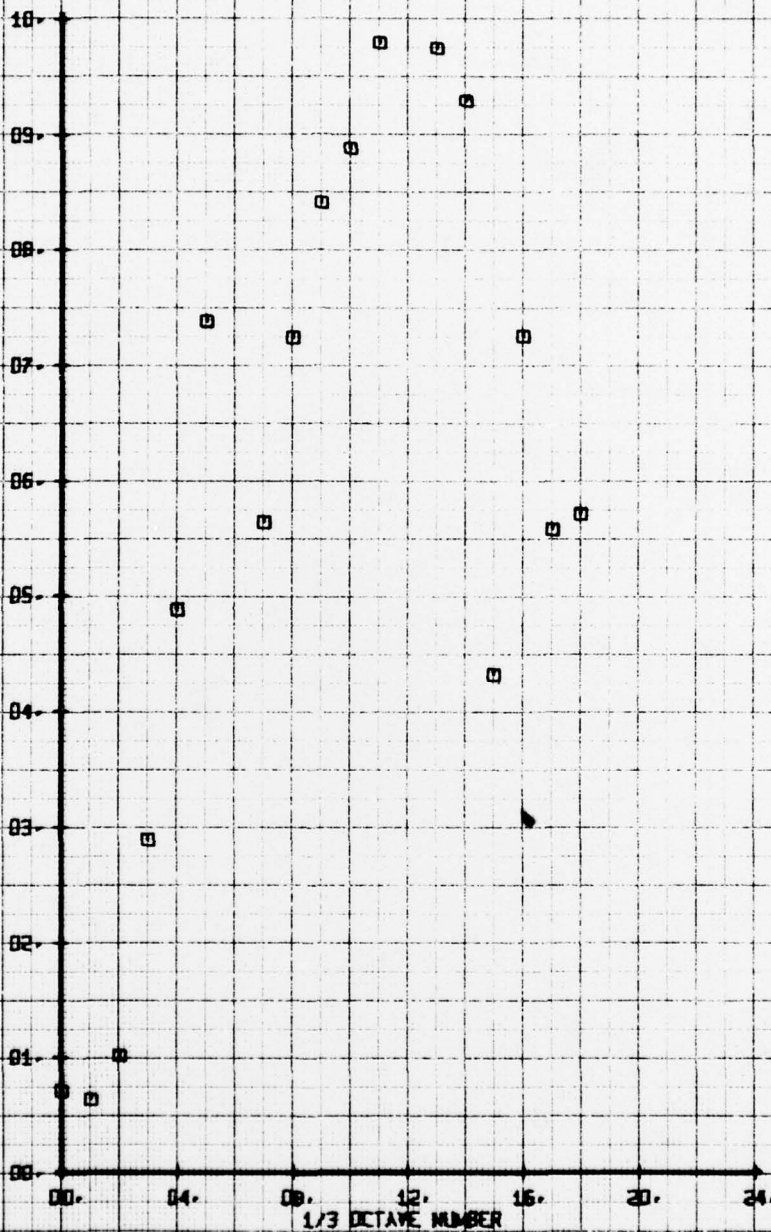
HOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR EJECT. BIFURCATED DUCT 150PSI  
 RUN 205 TP 9

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA EPS



NOT FILM WAVE 1/3 OCTAVE ANALYSIS  
 AIR ECT. BIFURCATED DUCT 150PSI  
 RUN 205 TP 4

SYM  
 □

CH  
 65

LEGEND  
 PARAMETER  
 V-BETA

X-2 VELOCITY COMPONENT V-BETA FPS

